

Mastering Milk

scientific and social debates on hygienic milk production in the Netherlands
(1918-1928)

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Illustration at the cover: model farm 'Berkendael' (undated)

Gemeente-Archief Den Haag, as reproduced in: Marc van der Marck and Jan Slot, *De geschiedenis ener melkinrichting: een eeuw consumptiemelk 1879-1979* (Amsterdam: J&T Publicity BV, 1979) 41.

Contents

Thanks & Dank.....	4
1. Introduction.....	5
1.1 Milk in historiography.....	5
1.2 Theory: actors, worlds and the environment.....	7
1.3 The Dutch context: the Warenwet, the milk decree, and the 'model zoonosis'.....	10
1.4 Question, period and sources.....	13
2. Milk as germ environment.....	14
2.1 Vulnerable milk.....	14
2.2 One or several tuberculosis bacteria?.....	15
2.3 Bacteria in the milk environment.....	18
2.4 The first problem of pasteurisation.....	21
3. Disease Resistance.....	23
3.1 Importance of the soil.....	23
3.2 Healthy milk.....	26
3.3 The special position of the young.....	29
3.4 The second problem of pasteurisation.....	32
4. Ideal milk.....	35
4.1 Farming physicians and veterinarians.....	35
4.2 Ideals in practice.....	38
4.3 Consumers and milk.....	41
4.4 The model milk decree.....	46
5. Milk as battle ground of experts.....	49
5.1 Bacteria or society, animals or people?.....	49
5.2. Chemical or medical authority?.....	53
5.3. Practice or theory? Farmers and veterinarians.....	55
5.4. The middle ground: milk traders.....	62
6. Bridging the rural-urban gap.....	66
6.1 The complex route of milk.....	66
6.2 The 'modern' city versus the 'backward' countryside.....	67
6.3 The 'unnatural' city versus the 'natural' countryside.....	71
6.4 Hygienic centralisation of the milk trade.....	72
7. Conclusion.....	76
Literature.....	80
Primary sources.....	80
Secondary sources.....	83
Attachment.....	87
Milk decree (June 23, 1925).....	87

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1. Introduction

I embarked on this master thesis project because of an interest in historical debates on the health risks of foods of animal origin. Delving into archival papers, I discovered a lot of material on milk. Although the Netherlands were and are a major milk producing country, a Dutch history of milk has never been written. However, milk serves an excellent opportunity to study several interesting questions, as it touches on many facets of society.

Milk is not simply a food, it is naturally produced *as* a food for young mammals. As all milk is essentially mother milk, it is laden with symbolic meaning. Milk provides an useful case to study historical human-animal relationships, in particular between cows and humans. Milk crosses the supposed boundary between 'culture' and 'nature'. Moreover, milk is very sensitive to germ infection. Therefore, historical meanings of disease in general and diseases shared by humans and animals (zoonotic diseases) in particular can be studied by using milk as a focus point. Touching on this issue is the relation between the medical and the veterinary profession during the modern period. Milk diseases cross the human-animal boundary which lies at the heart of the separate disciplines for human health and disease on the one hand and animal health and disease on the other. Milk itself as a chemical substance fits in the domain of chemistry. Controversies over the 'management' of milk can be expected to rise among all those disciplines. Moreover, milk touches on many layers of society. It is produced by farmers, traded by milk dealers, bought by house wives, consumed by many, and studied by scientists. Milk can be used as a lens to study the relations between those social groups.

For Dutch history in particular, milk is an interesting topic, as milk and dairy have been major Dutch products for centuries. Historians Bas van Bavel and Oscar Gelderblom have related the century-long Dutch reputation of cleanliness to the equally long importance of dairy products for the Dutch economy. In the late nineteenth century, Dutch cows had an excellent reputation because of their high milk yields, for which they were exported to the US and Canada. Dairy products like butter and cheese were major export products, mainly to Britain and Germany during the first decades of the twentieth century. Due to the quickly expanding cities from the second half of the nineteenth century onwards, the demand for consumption milk in the Netherlands itself had risen substantially as well. As a consequence, the quality of milk became a matter of scientific and social debate. In the 1920s, this debate found temporary endings at a national level with the milk decree (implemented in 1925) and the model milk decree (rejected in 1928). My focus will be on the debates around those decrees.¹

1.1 Milk in historiography

Until recently, milk has not been a subject of historical study on its own. In the Netherlands, milk has only been addressed as part of historical studies on food, agriculture, agricultural science, veterinary medicine and medicine. The research project on the history of technology in the Netherlands² has devoted one part to the history of food, which contains some sections on milk. Sociologist Anneke van Otterloo has discussed Dutch food during the modern period in a

¹ Jan Bieleman, *Boeren in Nederland: geschiedenis van de landbouw 1500-2000* (Amsterdam: Boom, 2008) 387-92; Bert Theunissen, 'Breeding without Mendelism: theory and practice of dairy cattle breeding in the Netherlands 1900-1950', *Journal of the history of biology* 41 (2008) 641; Bas van Bavel and Oscar Gelderblom, 'The economic origins of cleanliness in the Dutch Golden Age', *Past and present* 205 (2009) 41-69.

² The project *Techniek in Nederland*, coordinated by historian of technology H.W. Lintsen, consists of two main parts addressing various fields of Dutch technology during the nineteenth and twentieth century respectively: H.W. Lintsen a.o. eds., *Geschiedenis van de techniek in Nederland: de wording van een moderne samenleving 1800-1890* I-VI (Zutphen: Walburg Pers, 1992-1995) and H.W. Lintsen a.o. eds., *Techniek in Nederland in de twintigste eeuw* I-VII (Zutphen: Walburg Pers, 1998-2003).

sociological and historical study, in which she discusses the production and consumption of milk briefly as an example. Historian of medicine Annemarie de Knecht-van Eekelen has written on the development of scientific studies in infant feeding during the nineteenth century, in the context of the rising importance of paediatrics (child medicine), including developments in chemical research of cow milk. Historian of science Bert Theunissen has not directly addressed the issue of milk, but has devoted several articles to the history of cattle breeding in the Netherlands, illuminating the relations between cattle farmers and agricultural scientists during the twentieth century. Historian of veterinary medicine Peter Koolmees has devoted attention to food hygiene in the context of the professionalisation of veterinary medicine in the Netherlands. His dissertation on the history of meat inspection is closely related to the issue of milk inspection. Bartje Abbo-Tilstra has studied control measurements of one of the most important milk infections: tuberculosis of both humans and cattle in the Dutch cattle province Friesland, during the first half of the twentieth century. Agricultural historian Jan Bieleman has written an overview of the history of farming in the Netherlands, of which dairy farming has been an important component.³

These studies provide insights in several issues related to milk. However, they do not give an overall understanding of the historical meaning of milk in Dutch society. For instance, histories of public health tend to focus on the viewpoint of medical officials, and generally picture commercial companies and farmers as their enemies in the battle for public health. Consequently, farmers and milk dealers receive little attention, although their relation with scientists provides interesting material to study the position of science in society at large. Moreover, milk provides a case to study the historical dealings with zoonotic diseases in a Dutch context, a subject that has never been studied before. Abbo-Tilstra does pay attention to the dealings of farmers with bovine tuberculosis, but her account of both bovine and human tuberculosis does not provide an unifying thesis on the relations between human and animal disease. Milk provides an opportunity to illuminate these relations.

In international studies, milk has recently received attention as an object of study on its own, especially in the Anglo-Saxon countries. Historian of medicine Jacob Steere-Williams has recently graduated on a thesis on milk in Victorian Britain, discussing the influence of chemists, veterinarians and epidemiologists on the changing image of milk as a public health threat.⁴ He argues that scientific findings on the relation between milk and typhoid fever by epidemiological research was a major incentive for physicians, veterinarians and chemists in Britain to see milk as a public health problem. Steere-Williams nuances the role of dairy companies by arguing that some of them played a major role in improving hygienic circumstances of milk production. By placing milk and typhoid fever at the centre of developing fears on food-borne disease, Steere-Williams argues against the thesis of social historian of medicine Keir Waddington that bovine tuberculosis was the model food-borne zoonosis in nineteenth century Britain, and meat was seen as its main vehicle.⁵

³ A.P. de Knecht van Eekelen and A. Albert de la Bruhèze, 'De witte motor', J. Bieleman and A.H. van Otterloo eds., *Techniek in Nederland in de twintigste eeuw: landbouw en voeding* 3 (Zutphen: Walburg Pers, 2000) chapter 6, 311-21; Anneke H. van Otterloo, *Eten en eetlust in Nederland (1840-1990): een historisch-sociologische studie* (Amsterdam: Bakker, 1990); Annemarie de Knecht-van Eekelen, *Naar een rationele zuigelingenvoeding: voedingsleer en kindergeneeskunde in Nederland 1840-1914 (later Zuigelingenvoeding)* (Nijmegen: Koninklijke drukkerij G.J. Thieme, 1984); Bert Theunissen, 'Een mooie koe is een goede koe: wetenschappers en practici over de Nederlandse rundveefokkerij, 1900-1950', *Studium* 1 (2008) 47-61; Bert Theunissen, 'Breeding', 637-76; P.A. Koolmees, *Symbolen van openbare hygiëne: gemeentelijke slachthuizen in Nederland 1795-1940* (Rotterdam: Erasmus Publishing, 1997); Peter A. Koolmees, 'Veterinary inspection and food hygiene in the twentieth century', David F. Smith and Jim Philips eds., *Food, science, policy and regulation in the twentieth century: international and comparative perspectives* (London & New York: Routledge, 2000) 53-68; Bartje Abbo-Tilstra, *Om de sūnens fan it Fryske folk: tuberculose en haar bestrijding bij bevolking en veestapel in Fryslân, 1890-1940* (Leeuwarden: Fryske Akademy, 2002); Bieleman, *Boeren*.

⁴ Jacob Steere-Williams, *The perfect food and the filth disease: milk, typhoid fever, and the science of state medicine in Victorian Britain, 1850-1900* (unpublished PhD thesis at the University of Minnesota, 2011). I am grateful to the author for giving me access to his study.

⁵ Keir Waddington, *The bovine scourge: meat, tuberculosis and public health, 1850-1914* (Woodbridge: Boydell

Waddington shows how bovine tuberculosis became to be seen as a major zoonosis in the late nineteenth century, and argues that diseased milk and diseased meat became “synonyms” for tuberculous milk and meat by 1900. Historian of veterinary medicine Susan Jones has studied milk in its relation to the spread of bovine tuberculosis from rural to urban areas in the US and Britain.⁶ She argues bovine tuberculosis in milk changed from a predominantly urban problem to a rural problem. Both Jones and Waddington focus on the period before World War I.

Geographical historian Peter Atkins has been working on the history of milk in Britain for many years, and is currently working on an extensive overview in four volumes, of which the first on the relations between milk, science and the law has been published.⁷ Eventually, Atkins aims to capture all the different actors involved in the production, trade and consumption of milk: cattle farmers, milk traders, public health officials, and consumers. Atkins argues for an approach in which the materiality of milk is central. In most food histories, Atkins argues, the specific food under study could just as well have been some other material, as the real object of study is not the food but the social interactions of humans. Most material history is therefore social history in his eyes. In putting milk as a material at the centre of his interest, Atkins is able to show that milk is not a stable material, but reveals continuously changing qualities, due to natural processes and human interference.

I do not think Atkins' observation that histories of food are really about people is a major problem. A historical study of milk is mainly interesting because of its ability to illuminate the relations among groups in society and the relation between society and its environment. Although Atkins' argument that the materiality of milk was never something stable is convincing, I find it especially interesting what this instability of milk has meant for human society and its relation to the natural world. I will discuss theoretical approaches addressing exactly this topic in the following section.

1.2 Theory: actors, worlds and the environment

In science and technology studies, the analytical framework of actor-network-theory has attracted a lot of attention. This theory, developed by anthropologists Bruno Latour and Michel Callon, aims to follow 'actors' through their 'network' in order to understand the workings of power in science and society at large. Actors are not just human, but non-human as well. Animals, bacteria, chemical substances, scientists, laboratory assistants, they should all be granted an equal amount of 'agency' in the construction of knowledge. Networks are the interrelations between these actors. Latour emphasizes that such relations can not be explained by 'social factors', which he argues have become theoretical categories without meaning. Rather, students of science should follow their actors at a basic level through the network, without referring to higher level explanations. Non-human actors and human actors settle questions of authority and power among themselves in networks battling for power.⁸

Actor-network-theory has been criticized on its use of non-human 'actors', for instance by

Press, 2006).

⁶ Susan D. Jones, 'Mapping a zoonotic disease: Anglo-American efforts to control bovine tuberculosis before World War I', *Osiris* 19 (2004) 133-48.

⁷ P.J. Atkins, 'Sophistication detected: or, the adulteration of the milk supply, 1850-1914', *Social history* 16 (1991) 317-39; Peter J. Atkins, 'The pasteurisation of England: the science, culture and health implications of milk processing, 1900-1950', David F. Smith and Jim Philips eds., *Food, science, policy and regulation in the twentieth century: international and comparative perspectives* (London & New York, 2000) 37-51; Peter Atkins, 'The milk in schools scheme, 1934-45: “nationalization” and resistance', *History of education* 34 (2005) 1-21; Peter Atkins, 'School milk in Britain, 1900-1934', *Journal of policy history* 19 (2007) 395-427; Peter Atkins, *Liquid materialities: a history of milk, science and the law* (Farnham & Burlington: Ashgate, 2010).

⁸ Bruno Latour, *Reassembling the social: an introduction to actor-network-theory* (Oxford & New York: Oxford University Press, 2007).

Simon Shaffer.⁹ Can non-human actors be granted agency equal to humans in history, and if they can, what sources should we use to 'reach' this non-human agency? I do not agree with Shaffer's criticism that non-human elements can not be ascribed any agency at all. Animals and machines do have an influence in our human world, whether we want to call this agency or not. However, the insistence of Latour and Callon to grant non-human actors agency *equal to* humans seems at least infeasible to me: cows and bacteria did not leave any written sources. However, cows and bacteria did have an influence on the course of history, and we should be sensitive to this influence. As historian Susan Jones has argued, current scientific insights on such non-human actors (for instance molecular studies of the DNA of bacteria) can be used as sources to shine some light on non-human actors through history.¹⁰

Moreover, the rejection of 'social factors' by Latour and Callon has received critique. As Karin Garrety has argued in her analysis of the cholesterol controversy in post-war US: "It is difficult to explain *why* so many people came to believe in the salutary effects of low-fat, low-cholesterol diets without invoking the type of social explanations which Callon and Latour deem to be illegitimate."¹¹ Callon and Latour aim to settle such controversies by pointing at the decisive behaviour of non-human actors: scallops in Callon's study 'Some Elements of a Sociology of Translation', microbes in Latour's *Pasteurisation of France*.¹² However, as several scholars have argued, such explanations tend to look like traditional explanations in history of science in which scientific controversies are settled by nature itself: the great scientist thinks of an experiment that reveals nature's truth. As Garrety argues: "In persistent controversies, 'nature' remains more elusive and uncooperative."¹³ In such controversies, like the cholesterol controversy Garrety studies, actor-network-theory is of little help as it only offers extensive descriptions.¹⁴

Garrety sees more use in the 'social worlds framework' to explain persistent controversies on knowledge in society. This is a sociological theory, originating in the Chicago School of Sociology, and has been developed by symbolic interactionists Adele Clarke, Joan Fujimura and Susan Leigh Star.¹⁵ Symbolic interactionism studies the collective social negotiation of meanings (not necessarily on scientific topics). The social worlds framework keeps room for non-human agency, but does not argue like actor-network theory that such agency is necessarily equally important as human agency. It focuses on different 'social worlds',¹⁶ which are "loosely or rigidly structured units in which people share resources and information. They are characterized by a commitment to common assumptions about what is important, and what should be done."¹⁷ The phrase 'human ecology' is used to highlight the relations in and among different social worlds, and to bring attention to the inclusion of non-human actants in the analysis. The relation of humans with their environment, and with non-human actants like animals, bacteria, or even machines is of importance in such an 'ecological' approach. The whole of interacting social worlds is termed an 'arena'. Also, social

⁹ Simon Schaffer, 'The eighteenth brumaire of Bruno Latour', *Studies in history and philosophy of science* 22 (1991) 179-92.

¹⁰ Susan D. Jones, *Death in a small package: a short history of anthrax* (Baltimore: The Johns Hopkins University Press, 2010) 6-7.

¹¹ Karin Garrety, 'Social worlds, actor-networks and controversy: the case of cholesterol, dietary fat and heart disease', *Social studies of science* 27 (1997) 753.

¹² Michel Callon, 'Some elements of a sociology of translation': domestication of the scallops and the fishermen of St Brieuc Bay', in John Law ed., *Power, action and belief: a new sociology of knowledge?* (London & Boston, MA: Routledge & Kegan Paul, 1986), 196-233; B. Latour, *The Pasteurization of France* (Cambridge, MA & London: Harvard University Press, 1988).

¹³ Garrety, 'Social worlds', 754.

¹⁴ *Ibidem*, 753-4.

¹⁵ Adele E. Clarke and Susan Leigh Star, 'The social worlds framework: a theory/methods package', *The handbook of science and technology studies* (Cambridge, MA & London: The MIT Press, 2008) 113-137; Garrety, 'Social Worlds', 730.

¹⁶ Clarke and Star, 'The social worlds framework', 113. Clarke and Star define social worlds as "universes of discourse", shared discursive spaces that are profoundly relational".

¹⁷ Garrety, 'Social worlds', 730.

worlds are thought of as fluid. This characteristic of social worlds preserves room for change over time, in other words for history. Another important characteristic of social worlds is that one individual can belong to different social worlds.¹⁸

A central concept for the interactions among different social worlds is a 'boundary object', an object that crosses the boundaries between different social worlds, and becomes an object of controversy, discussion, and negotiation. According to Clarke and Star, "the study of boundary objects can be an important pathway into complicated situations".¹⁹ Star and James E. Griesemer offered such an analysis of a complicated situation in their influential article on the practices of and negotiations between different social worlds in the Museum of Vertebrate Zoology in Berkeley in the beginning of the twentieth century. The museum specimens are the most important boundary objects in this case study.²⁰

The debate on milk during the 1920s in the Netherlands can be called an 'arena' in social worlds framework terminology as well. The debate had the characteristics of a controversy: the unstable material characteristics of milk, paradoxical scientific findings, and different human interests were material for a debate of several years. The different groups of human actors involved can be defined as social worlds: veterinarians, physicians, chemists, cattle farmers, milk dealers and consumers are the main ones that will show up in my thesis. These groups of people can be shown to have similar concerns, to share discourses, and to be concerned over boundaries between their own world and other social worlds. This is a reason why Latour's avoidance of 'social factors' will not work for the Dutch controversy on milk. Farmers, for instance, consequently dubbed themselves 'men of practice', as opposed to the academically trained physicians and veterinarians – men of theory. Moreover, the participation of actors in different social worlds will be useful for my thesis in order not to see social worlds as rigid structures. One of my main actors, Dirk Aart de Jong, was a veterinarian by training, he was appointed professor of comparative medicine at the medical faculty of Leiden, while his father was a farmer.

The most important boundary object in the controversy over milk was of course milk itself. Seeing milk as a non-human actor settling the dispute in actor-network-theory fashion will not work, as the liquid did not solve anything. Rather human actors were faced with conflicting characteristics and meanings of milk, as I will argue, and milk can therefore better be seen as an object of dispute, a boundary object. Other boundary objects can be defined in the debate as well: cows, bacteria, milking equipment, stables, and even infected human beings who were seen as spreaders of milk disease. All those 'objects' were topics of discussion among the interacting social worlds of medical professionals, farmers, milk dealers and consumers.

Although both the social worlds framework and actor-network-theory are historically orientated, both are essentially sociological theories to study the workings of science and knowledge practices in society. The disadvantage of sociological theory is that it uses models to describe and explain developments in society. Historians have trouble with the use of models regularly, as they tend to see historical developments as contingent. See for instance the nuances Peter Koolmees has added to the sociological collectivisation model of Abram Swaan. According to Swaan, increasing collectivisation took place during the nineteenth and twentieth century as a result of imperative expansion of government influence. Koolmees shows this picture of collectivisation should be nuanced based on his research of slaughterhouses. The founding of many public slaughterhouses was advocated by individuals or public health committees rather than the (local) government.²¹ Historians are more inclined to follow their sources than to mould them into a-historical sociological models.

Nevertheless, sociological models are useful in structuring sources and thoughts. Moreover,

¹⁸ Clarke and Star, 'The social worlds framework'; Garrety, 'Social worlds', 730-2, 755-7.

¹⁹ Clarke and Star, 'The social worlds framework', 121.

²⁰ Susan Leigh Star and James R. Griesemer, 'Institutional ecology, "translations", and boundary objects: amateurs and professionals in Berkeley's museum of vertebrate zoology, 1907-1939', *Social studies of science* 19 (1989) 387-420.

²¹ Koolmees, *Symbolen*, 17-8, 274-5.

the social world framework is fluid and leaves room for historical contingency, by seeing social worlds as changing, and people as taking part in different social worlds. I have been inspired by the social worlds framework in my selection of sources and my analysis of the relations between different groups of people around the boundary object of milk, but it is not the major focus of my thesis. My main aim is to illuminate the dealings of different social groups with milk in a historical perspective, using the social worlds framework as an analytical tool.

I have also been inspired by the work of environmental historians. Environmental history was defined as a discipline in the US of the 1970s. Environmental historians aim to look at history through an ecological lens. They emphasize the importance of non-human elements like animals, plants, climate and geography in historical studies in which the relation between nature and humans is explored.²² Environmental historian William Cronon is interested in the relations between urban and rural areas, and argues against the idea that 'nature' and 'culture' are two separate domains, or against the definitions of nature as 'non-human' and culture as 'unnatural'.²³ In *Nature's metropolis*, an extensive history of Chicago, Cronon shows the intimate ties between the city Chicago and the countryside surrounding it. By following three of Chicago's major commodities – wheat, meat and lumber – Cronon illustrates how connected Chicago was (and is) to its hinterland, and how the histories of both city and countryside are closely related. Without Chicago as a trade centre, the countryside would never have developed as it did. Without the countryside as first producer of commodities, Chicago would never have become a metropolis. This argument is of interest for my study of milk as a major commodity traded between the Dutch countryside and its quickly expanding cities.

1.3 The Dutch context: the *Warenwet*, the milk decree, and the 'model zoonosis'

In order to put the Dutch milk debate of the 1920s into context, I will discuss some important developments concerning food and milk inspection. During most of the nineteenth century, milk research and inspection was done in order to expose chemical adulteration of the liquid. During the latter decades of the nineteenth century, disease infection of milk was increasingly seen as an important threat to the quality of milk as well. This was a result of the rise of bacteriology, and, as Steere-Williams has recently shown, also of statistical epidemiological research on typhoid fever in the 1860s and 1870s.²⁴

In the Netherlands, the city of Amsterdam had been the first in 1858 to introduce local regulations on the inspection of food, but it included regulations on water-diluted milk only in 1879. These regulations concerned the permitted chemical components of water. It remains to be studied whether they were also caused by the growing fears of possible disease infection of milk via infected water, in line with Steere-Williams' argument that fears of typhoid infection of milk came to the fore in the 1870s in Britain. Other Dutch cities founded local food inspection services generally in the beginning of the twentieth century. Around the same time, a collection of guidelines for the research of foodstuffs – the *Codex Alimentarius* – was written by a committee of Dutch hygienists. The first *Codex Alimentarius* of 1907 was devoted to milk, showing the central position of milk concerning food quality. Not only chemical adulteration, but also several diseases that could infect milk were mentioned. Until 1920, five other editions appeared, on fat and cheese; water; general methods of research; flour and bread; and sugar, syrups and honey. The codex was translated into national law in the *Warenwet*, in 1919. The *Warenwet* is more or less comparable to a combination of the British Food and Drugs Act and the Commodities Act. To prevent

²² John Opie a.o. eds., *Environmental review: an interdisciplinary journal* 1 (1976) 1.

²³ William Cronon, *Nature's metropolis: Chicago and the Great West* (New York & London: W.W. Norton & Co., 1991); William Cronon, 'The trouble with wilderness; or, getting back to the wrong nature', in William Cronon ed., *Uncommon ground: rethinking the human place in nature* (New York & London: W.W. Norton & Co., 1995) 69-90.

²⁴ Steere-Williams, 'The perfect food', chapter 3; De Knecht-van Eekelen, *Zuigelingenvoeding*, 187-8.

misunderstandings, I will use its Dutch name. The *Warenwet* regulated the inspection of commodities in the Netherlands. For meat a separate Meat Inspection Act was written in 1919.²⁵

The *Warenwet* was elaborated in separate detailed decrees for the commodities and foodstuffs concerned. The milk decree was discussed as one of the first between 1920 and 1925, it was accepted in June 1925. As hygienists were not satisfied with this milk decree, they tried to introduce a more strict decree during the latter half of the 1920s, known as the model milk decree. These attempts proved to be futile.²⁶

Due to the origin of food inspection in concerns over chemical adulteration, experts involved in the *Codex Alimentarius* and *Warenwet* were mainly chemists and pharmacists. During the twentieth century, they became the heads of the municipal Food Inspection Services. Some physicians were involved as well, due to the relatively new concerns on the dangers of disease infection of food. Veterinarians had a large role in the application of the Meat Inspection Act, but gained little influence in the food inspection services of the *Warenwet*. These disciplinary differences in food inspection were of great concern to the scientific experts involved in the milk debate. Scientific professionals concerned with public health issues, like the nineteenth century sanitary reforms, were collectively called hygienists.²⁷

The main concerns on zoonotic disease were centred around tuberculosis in the beginning of the twentieth century in an international context. According to Waddington bovine tuberculosis had by then turned into the 'model zoonosis' which could spread via both meat and milk. Tuberculosis was one of the major diseases affecting humans during these decades. In the Netherlands, it was called 'enemy of the people number one', although reliable numbers on how many people suffered from tuberculosis are not available for the entire country.²⁸ When Robert Koch discovered the TB bacterium in 1882, he argued that TB bacteria found in tuberculous humans were similar to TB bacteria found in tuberculous cows. With this, Koch was confirming theories on the similarity of tuberculosis in humans and cows already advocated by veterinarians in the 1860s and 1870s, and by physicians in the late 1870s, as Waddington has shown for the British situation. In the Netherlands, consuming the meat or milk of such cows was increasingly considered dangerous as well. In 1901, Koch changed his opinion on the unity of bovine and human tuberculosis radically. In an address to the International Tuberculosis Congress in London he argued that the TB bacteria in humans and cows were of different kinds, and could not cross-infect. Koch's address caused a lot of unrest. Many bacteriologists did not believe him, based on their own research, but also based on the already far-reaching measures against bovine tuberculosis, for instance in Great Britain. In the following years, the issue was fiercely discussed among bacteriologists from different countries. The German immunologist Emil A. von Behring (1854-1917) argued in the beginning of the twentieth century that all human tuberculosis was caused by ingestion of cow milk. A British Royal Commission of 1901-1911 was installed "to prove Koch wrong", and concluded that bovine tuberculosis was a danger to humans as well.²⁹

Currently, the micro-organism which causes tuberculosis in humans is called *Mycobacterium tuberculosis* and the micro-organism which causes tuberculosis in dairy cattle is

²⁵ De Knecht-van Eekelen, *Zuigelingenvoeding*, 166-7, 210-1; Koolmees, *Symbolen*, 270-3; Marc van der Marck and Jan Slot, *De geschiedenis ener melkinrichting: een eeuw consumptiemelk 1879-1979* (Amsterdam: J&T Publicity BV, 1979) 10.

²⁶ 'Melkbesluit: Koninklijk besluit van den 23sten Juni 1925, tot toepassing der artikelen 14 en 15 van de Warenwet (Staatsbl. 1919, no. 581)', *Staatsblad* 256 (1925); Nationaal Archief Den Haag (Dutch National Archives The Hague, later NA), 2.15.37 Algemeen Rijksarchief, Afdeling Volksgezondheid 1902-1950 (General State Archives, Department of Public Health, later DPH), inv. nr. 366 Stukken betreffende de totstandkoming van besluiten inzake modelmelk (Modelmelkbesluit) 1928-1949 (Papers concerning decrees on modelmilk), Letter *Warenwet* commission to the Minister of Labour, May 29, 1928.

²⁷ De Knecht-van Eekelen, *Zuigelingenvoeding*, 167; Koolmees, *Symbolen*, 109-10, 182-8.

²⁸ Abbo-Tilstra, *Om de sùnens*, 2-3.

²⁹ Waddington, *The bovine scourge*, chapter 3, 7, and 10; Abbo-Tilstra, *Om de sùnens*, 52-57; Jones, 'Mapping', 133; Koolmees, *Symbolen*, 125-6.

called *Mycobacterium bovis*. These mycobacteria are considered different species, although their DNA is “highly homologous”, and they can cross-infect.³⁰

In 1890, Koch thought he had found a medicine against tuberculosis: tuberculin, made of attenuated tuberculosis bacteria. Tuberculin proved not to work as a medicine, but was found to be an useful aid to diagnose tuberculosis, as it worked like a serological test. Both cows and humans reacted to injected tuberculin with a swollen, red spot when their bodies housed TB bacteria. Tuberculosis not yet visible clinically in seemingly healthy people and animals could be made visible with tuberculin. Now, 'open' and 'closed' tuberculosis could be distinguished in living individuals. Open tuberculosis meant tuberculosis bacteria were excreted by the patient and could be proven with microscopical research. Closed tuberculosis was tuberculosis that could only be defined by a positive reaction to tuberculin. Related to this, a distinction was made in the late nineteenth century between localised and generalised tuberculosis. After the death of an animal, the typical tubercles after which tuberculosis was named could be found in localised spots in the bodies of such animals. As Waddington has shown in his study on meat and bovine tuberculosis, this distinction resulted in extensive scientific and social debate whether all meat of animals with localised tuberculosis was dangerous for consumption or not. This debate was held on milk as well: it was discussed whether only cows with a tuberculous udder could infect the milk with TB bacteria, or the milk of cows with tubercles in other organs was dangerous as well.³¹

In the Netherlands, the necessity of measures against bovine tuberculosis because of fears for public health were a matter of debate among veterinarians, as Abbo-Tilstra and Koolmees have shown. In 1877, reporting of bovine tuberculosis (or 'pearl disease', *parelziekte*) was deemed necessary by the state veterinary school. In 1904, the Dutch government started to support the eradication of tuberculous cows diagnosed clinically or through bacteriological research of their milk, by financially compensating the farmers. The system was called 'Poels-Lovink', after the main experts behind the royal decree. It was used until 1910, when the costs proved to be too high. The system was replaced by a system in which some financial compensation was only offered when the cattle farmer followed strict rules. This system was operative until 1928. Both systems were based on the responsibility of the farmers themselves and were not compulsory.³²

In politics, the 1920s were a period of confessional governments, and rapidly accepted social regulations, after a long period of *laissez faire* politics - although liberal parties had accepted several regulations to improve social circumstances from the late nineteenth century as well. The social democrats (*Sociaal-Democratische Arbeiders Partij*, SDAP) had won twenty-two out of hundred chairs in Parliament after the introduction of general suffrage for men in 1917. Although this was less than hoped for, the leader of the social democrats P.J. Troelstra (1860-1930) called for a Dutch revolution in November 1918, without success. Confessional parties (catholics, conservatives and protestants) were the most important winners of the elections. Encouraged by the threat from the social democrats, but also by other factors like the negative effects of the First World War on Dutch society, the new confessional government rapidly passed social legislation like general suffrage for women, a labour act in which the working day of labourers was restricted to eight hours, and an act on the care for the disabled and the elderly. The *Warenwet* and the Meat Inspection Act were also part of these social reforms. An important figure was P.J.M. Aalberse (1871-1947), the catholic Minister of Labour (Minister of Labour, Trade and Industry from 1922 onwards) in the government under prime minister Ch.J.M. Ruijs de Beerenbrouck (1918-1925).³³

³⁰ Michael T. Madigan and John M. Martinko, *Brock biology of microorganisms* 11th edition (Upper Saddle River: Pearson Prentice Hall, 2006) 14, 857.

³¹ Jones, 'Mapping', 133-5; Waddington, *The bovine scourge*, chapter 5; Abbo-Tilstra, *Om de sùnens*, 54-6.

³² Abbo-Tilstra, *Om de sùnens*, 52-6, 204-5; Koolmees, *Symbolen*, 124-8.

³³ Rolf Schuurms, *Jaren van opgang: Nederland 1900-1930* (Meppel: Uitgeverij Balans, 2000) 168-72, 223-37; J.P. de Valk and A.C.M. Kappelhof ed., *Dagboeken van P.J.M. Aalberse 1902-1947* (Den Haag: Instituut voor Nederlandse Geschiedenis, 2006) xxiv-xxix; Koolmees, *Symbolen*, 180-2.

1.4 Question, period and sources

Because of the writing of the milk decree and model milk decree, milk was an object of vehement scientific and social debate in the Netherlands of the 1920s. Therefore, the 1920s will be my main period of study. As bovine tuberculosis was seen as one of the main threats to the consumers of milk, I will also analyse the discussion on animal tuberculosis by the State Committee on the control of tuberculosis, which was operating from 1918 until 1920.

As the issue of milk infection was increasingly seen as an important threat to public health and this was the main incentive for milk inspection during the twentieth century, my main focus will be on the medical and veterinary discussions on milk. However, I will also investigate to what extent other social groups took part in the milk debate, keeping in mind that in controversies as on milk, different 'social worlds' take part. My central question will be: why was milk subject of vehement scientific and social debate during the 1920s, who were the major players (social worlds) involved, and how did they relate to each other?

There is a lot of published and archival material on milk. I have focussed on archival papers on the milk decree of the Dutch government departments of public health (part of the Ministry of Labour) and agriculture in the National Archives in The Hague. Moreover, I have studied the archives of the State Committee on tuberculosis. To put those archival sources in a broader context, I have used journals and newspapers. Scientific journals were of importance for the viewpoints of physicians and veterinarians. I have used their main ones: the Dutch Journal of Medicine (*Nederlandsch Tijdschrift voor Geneeskunde, NTVG*) and the Journal of Veterinary Medicine (*Tijdschrift voor Diergeneeskunde, TvD*). For the viewpoint of farmers, I have studied a widely read agricultural weekly: the *Veldbode*. Milk traders voiced their opinions in their own journals, for instance the *Algemeene Zuivel- en Melkhygiënisch Weekblad*. For the viewpoint of consumers, I have used the popular weekly *Het Leven Geïllustreerd*, women's magazines and literature on housekeeping.

As the social worlds I am investigating were complex and not uniform, I realise my selection of sources will not result in a 'complete' story on the milk controversy. Farmers were not a homogeneous group, for instance, consisting of people differing immensely in social-economic, political, and geographical characteristics.³⁴ For the other social worlds involved in the debate on milk something similar was the case. I have strived to do justice to these differences as much as possible, but I do not expect my thesis will capture all.

A note on the meaning of 'milk' is in place here as well. When I write 'milk' without any specification, I mean cow milk. Milk of donkeys, goats and sheep was consumed to some extent as well. Moreover, human milk was of importance when the feeding of infants was concerned, a topic I will address in more detail. In general however, cow milk was the most important dairy produced and discussed in the beginning of the twentieth century.³⁵

My chapters are ordered according to the reasons why milk was debated. In chapter 2, I will investigate the meaning of milk as carrier of germs. In chapter 3, the meaning of milk as healthy, pure and natural food is central. The medical solution to these conflicting meanings of milk, was to advocate 'model milk', discussed in chapter 4. Veterinarians and physicians will be the main actors of these first three chapters, as they started the debate on the dangers of disease infection of milk. Consumers will be discussed in chapter 4, as the success of model milk depended on their enthusiasm. In chapter 5, the authority claims of different social worlds on the boundary object milk will be studied, including scientific experts, cattle farmers, milk dealers and consumers of milk. In chapter 6, the debate on milk will be discussed in the light of rural-urban relations and meanings, as milk crossed the rural-urban boundary on its way from the farm to its major place of consumption – the city.

³⁴ Piet van Cruyningen, *Boeren aan de macht? Boerenemancipatie en machtsverhoudingen op het Gelderse platteland, 1880-1930* (Hilversum: Verloren, 2010) 285.

³⁵ De Knecht-van Eekelen, *Zuigelingenvoeding*, 180-3.

2. Milk as germ environment

2.1 Vulnerable milk

The first reason why milk became a central topic for debate was its vulnerability to bacteria infection. Steere-Williams has analysed the change in the image of milk in nineteenth century Britain. Around 1850, adulteration was considered the most important threat to the quality of milk and other foods. It was mainly seen as an economic problem: one did not get one's money's worth. Due to epidemiological research on the spread of typhoid fever in the 1870s (following the example of Snow's famous epidemiological research of cholera), milk became seen as a vehicle of disease. From a social problem milk had turned into a public health problem. Waddington has shown that tuberculosis became the 'model zoonosis' which could be spread by both meat and milk in the beginning of the twentieth century.¹

De Knecht-van Eekelen discusses only foot-and-mouth disease and tuberculosis as diseases that were considered to infect the milk around 1870 in the Netherlands. Whether epidemiological research of typhoid fever had a role comparable to the one Steere-Williams describes for Great Britain remains to be studied. In any case, in the beginning of the twentieth century anthrax, tuberculosis, streptococci, staphylococci, typhoid fever, cholera, diphtheria, foot-and-mouth disease and scarlet fever were all seen as possible contaminators of milk. They were mentioned in the first edition of the *Codex Alimentarius* in 1907, which was devoted to milk. In the *Codex*, a certain amount of bacteria² present in milk was established as an official quality standard. Milk with more than 1 million bacteria per mL was deemed unfit for human consumption, and milk with more than 100 000 bacteria per mL was considered unfit for infants.³

The 'milk diseases' mentioned in the *Codex* were referred to by hygienists. Typhoid fever and tuberculosis were regarded the most dangerous. Tuberculosis – the “scourge of the population” according to physician E.C. van Leersum – was seen as a major threat to the milk, and this was directly linked to its animal source. Tuberculous cows could excrete TB bacteria in their milk. Also it could be infected by tuberculous people who handled the milk. The severity of the animal danger was debated on, as I will show in this chapter. Typhoid fever was seen as another main threat to the milk quality. This disease was mainly seen as an environmental problem, spread by adulterated milk with infected water, by the use of infected milking equipment and by people with typhoid fever. Animals infected with typhoid fever were not discussed. Milk was seen as especially vulnerable for germs, as they could easily survive and multiply in the nutritious substance.⁴

Ideas on the similarity of bovine and human tuberculosis were important for the ideas on diseases which could infect the milk. In order to learn more about the contemporary ideas on the meaning of animal disease in general and cow disease in particular for human health in the Dutch context, I will discuss tuberculosis in more detail in the next sections. The main expert on the meaning of animal tuberculosis for human health was veterinarian Dirk Aart de Jong (1863-1925).

¹ Steere-Williams, *The perfect food*, chapter 3; Waddington, *The bovine scourge*, chapter 10.

² I will consequently use the word 'bacteria', although the historical actors in my story use varying terminology for the micro-organisms: bacteria (*bacteriën*), bacilli (*bacillen*), germs (*ziektekiemen*), infectants (*smetstoffen*) etc. In quotations I will use their original term.

³ De Knecht-van Eekelen, *Zuigelingenvoeding*, 166-167, 187-191.

⁴ M.D. Horst a.o., 'Melkbesluit', *Nederlandsch Tijdschrift voor Geneeskunde* (later *NTvG*) 70 (1926) 492-500; G.H. Moll van Charante, 'De zorg voor het verkrijgen en beschikbaar stellen van modelmelk', *NTvG* 61 (1917) 793-797; H.M. Kroon, 'De hygiëne der melkproductie', *NTvG* 64 (1920) 205-206; C.F. van Oyen, 'De productie van zuivere, ziekte-kiemvrije, versche melk', *Het Algemeen Zuivel- en Melkhygiënisch Weekblad* 20 (1924) 9 (offprint); Chief inspector of public health (contagious diseases), 'Bestrijding van buiktyphus en roodvonk', *Verslagen en mededelingen betreffende de volksgezondheid* (1925) 345-353; E.C. van Leersum, 'Pure melk', *Haagsch Maandblad* 4 N°6 (December 1925) 3 (offprint), Dutch quote: “geesel der bevolking”. I have translated early twentieth century Dutch quotes into modern English to the best of my abilities. I will quote the original in footnotes in the case of longer quotes, or when I think the original Dutch communicates the historical meaning better.

2.2 One or several tuberculosis bacteria?

Tuberculosis was one of the most discussed diseases that could infect milk. The main reason for this was the international, scientific discussion on the nature of bovine and human tuberculosis: should they be considered as two different diseases, or as one and the same? This debate was fuelled by the radical change of opinion of Robert Koch in 1901, when he started to argue that bovine and human TB bacteria were completely different types, opposing his own earlier opinion, and the opinion of many bacteriologists.⁵

In the Netherlands, De Jong was a central figure in this debate. In 1918, he was invited to join the State Committee on tuberculosis being the Dutch expert on the meaning of animal tuberculosis for human health. De Jong started investigating tuberculosis bacteria in the 1890s when he was working on meat hygiene for the slaughterhouse in Leiden. He was inspired in the first place by the work of the earlier Dutch expert on tuberculosis, the internationally orientated veterinarian M.H.P.J. Thomassen (1847-1906), who had spoken out against Koch at the congress of 1901. In the second place De Jong's scientific work was fuelled by Theobald Smith's research in the US who had already argued that bovine and human TB bacteria were distinct bacteria before Koch did. De Jong would argue against Smith and Koch, and support Thomassen during the rest of his career: bovine tubercle bacteria could infect humans and should be considered a danger for public health. Already during the 1890s, his work on animal tuberculosis was well-respected, as a report of the Dutch Royal Agricultural Committee attests to.⁶

De Jong was a veterinarian by training. As such, he was appointed part-time professor of comparative medicine at the medical faculty of Leiden in 1908, unique in the Netherlands at that time. He got a full-time appointment in 1920. During several years, De Jong combined his work as head of the local slaughterhouse with his job as professor. De Jong was a dedicated researcher, who visited international conferences, and published in Dutch, German, French and English. He studied a variety of diseases shared by humans and animals, and also devoted time to research the health dangers of several foods of animal origin, like milk, meat, and fish. Related to his interests in comparative medicine, was his research of methods to kill or weaken bacteria in foods. In 1918, for instance, he was given a subsidy of f 6000,- by the government to research a method to store meat by freezing it.⁷

Based on his own work and on French, German and British research, De Jong had outspoken ideas on the dangers for humans of bovine tuberculosis:

Tuberculosis of cattle (bovine tuberculosis) is dangerous for mankind, not only because tubercle bacilli in milk, dairy products or meat can result in food infection, but also because tubercle bacilli of bovine animals, spread in some way or another, are dangerous for mankind.⁸

⁵ Abbo-Tilstra, *Om de sūnens*, 57; Jones, 'Mapping', 133; Koolmees, *Symbolen*, 125-6.

⁶ C. Offringa, *Van Gildestein naar Uithof: 150 jaar diergeneeskundig onderwijs in Utrecht, Deel I's Rijksveeartsenijschool (1821-1918) Veeartsenijkundige Hoogeschool (1918-1925)* (Utrecht: Rijksuniversiteit Utrecht, 1971), 176-7, 193, 237; Koolmees, *Symbolen*, 126-7; D.A. de Jong, 'De oorzaak der tuberculose in de laatste dertig jaren', *Veterinair Studenten Maandblad Absyrtus* 3, N°4 (1913) 10-11; NA, 2.19.120 Koninklijk Nederlands Landbouwcomité 1900-1940 (Royal Dutch Agricultural Committee, later RDAC), inv. nr. 6 Stukken betreffende tuberculose onder het rundvee 1900-1914 (Documents regarding tuberculosis among cattle), Concept report on tuberculosis, November 1896, 3. A list of all De Jong's publications can be found at the end of his obituary: J.J.F. Dhont, 'Dirk Aart de Jong', *Tijdschrift voor Diergeneeskunde* (later *TvD*) 52 (1925) 599-604.

⁷ Offringa, *Van Gildestein*, 235-238; Dhont, 'Dirk Aart de Jong', 589-94; NA, 2.11.22.01 Ministerie van Landbouw en Visserij, Afdeling Visserijen 1920-1950 (Ministry of Agriculture and Fisheries, Department of Fisheries), inv. nr. 793, Het verlenen van subsidie aan Prof. Dr. de Jong te Leiden voor de toepassing van het procedé Otessen (The granting of subsidy to Prof. Dr. De Jong in Leiden for use of the Otessen method), 1918.

⁸ D.A. de Jong, 'Tuberkelbacillen van mensch en dieren', W. Roëll a.o., *Verslag van de Staatscommissie ingesteld bij KB van 3 July 1918 no. 25 tot voorlichting over wettelijke maatregelen tot bestrijding van de tuberculose en over de beste wijze van bestrijding dier ziekte* (Den Haag: Van Langenhuyzen, 1922) attachment 6, 212-213. Dutch quote: "Tuberculose van het vee (rundertuberculose) vormt een gevaar voor den mensch, niet alleen omdat tuberkelbacillen in melk, zuivelproducten of vleesch aanleiding kunnen geven tot voedingsinfectie, doch ook omdat tuberkelbacillen van het rund, op welke wijze ook verspreid, een gevaar vormen voor den mensch."

No “fundamental, consistent difference” existed between bovine and human tubercle bacteria. De Jong blamed his fellow Dutchmen for being too uncritical towards Koch's position.

And not only cows could infect humans with tuberculosis. Throughout his career, De Jong argued that more animal species susceptible to tuberculosis posed a danger for human health. Around 1900, just before Koch's shocking speech, De Jong investigated the susceptibility of different animal species to tuberculosis bacteria of different animal and human sources. One of his conclusions was that TB bacteria from cows were virulent for several animal species - dogs, sheep, apes, goats - and humans. In 1900, De Jong published several booklets on tuberculosis of animal species,⁹ resulting in 1902 in the publication 'The unity of tuberculosis of mammals'.¹⁰ With this title, De Jong did not just protest Koch's opinion on the fundamental difference between bovine and human tuberculosis, but he added that such a difference did not exist between *any* TB bacteria infecting mammals. In the 1900s, De Jong extended his research to other mammals, and to birds. He concluded in 1913: “it is illicit to keep putting up a barrier between mammalian and avian tuberculosis, because the mammalian tubercle bacillus can change itself, through variation or maybe through a simple mutation, into an avian bacillus”.¹¹ According to De Jong, no different species or types of TB bacteria existed at all.

As a consequence of his argument that TB bacteria were fundamentally the same in animal species, De Jong saw the identification of the source of TB bacteria through scientific research as a problem. Although he did not explicitly address this consequence, the argument undermined some of his work. When the source of TB bacteria was never to be found for certain, how could De Jong prove that for instance TB bacteria from birds had infected guinea pigs? Therefore, De Jong did not deny the existence of different characteristics of TB bacteria infecting different animal species entirely. He thought those differences existed, for instance in virulence or in lesions caused, and he worked with them as indicators of the source of the bacteria. However, he was convinced that no *permanent* differences between TB bacteria existed, they could change and show entirely different characteristics. His final solution for the problem seems to have been to picture the TB bacteria as almost ubiquitous. To control tuberculosis effectively, measures against all those bacteria, “regardless of what kind of origin”, should be taken. Tuberculous birds, cows, dogs, mice, people, they were all possible carriers of tuberculosis bacteria, and therefore dangerous for human health.¹²

Therefore, the danger for humans was growing when nothing would be done against the many Dutch animals suffering from tuberculosis. Moreover, De Jong feared that the incidence of animal TB infection among humans was under-reported, as the differences between TB bacteria of different animal species were not clear. Therefore, he thought statistics on how often animals infected humans with tuberculosis unreliable – these numbers generally showed tuberculosis infections of animal origin to be of minor importance.¹³

Connected to De Jong's opinion that animal tuberculosis was a neglected danger, he argued that different clinical types of tuberculosis, most importantly tuberculosis of the lung and tuberculosis of the intestines, were not necessarily caused by respectively inhalation and ingestion

⁹ D.A. de Jong, *Veterinaire pathologie en hygiëne: mededeelingen en onderzoeken uit praktijk en laboratorium* (Leiden: G.L. van den Berg, 1900).

¹⁰ D.A. de Jong, *De eenheid der zoogdiertuberculose* (Leiden: Van Doesburgh, 1902).

¹¹ D.A. de Jong, 'Rundertuberkelbacillen bij den mensch, en het niet-standvastig zijn van de zoogenaamde “typen” van tuberkelbacillen', *NTvG* 57 (1913) 118. Dutch quote: “het is niet geoorloofd een slagboom tusschen de zoogdier- en de vogeltuberculose te blijven opstellen, omdat de zoogdiertuberkelbacillus zich door variatie of misschien door eenvoudige mutatie, in een vogelbacillus kan veranderen”.

¹² De Jong, 'Rundertuberkelbacillen', 120; De Jong, 'Tuberkelbacillen', 213.

¹³ NA, 2.27.14 Staatscommissie inzake de bestrijding der Tuberculose 1917-1920 (State Committee for the control of Tuberculosis, later SC), inv. nr. 33, Notulen van de Subcommissie voor de directe bestrijding 1918-1920 (Minutes of the Subcommittee for the direct control), February 1, 1919, 103, 105; D.A. de Jong, 'Beteekenis van de bestrijding der diertuberculose en van goede voedselkeuring voor de bestrijding van tuberculose by den mensch', *Roëll a.o., Verslag*, 217.

of bacteria. He pointed at findings with calves to argue that ingested TB bacteria could move to the lungs and cause tuberculosis of the lungs. He extended this argument to humans. Post-mortem examination of a tuberculous person or animal was therefore useful for the localisation of the disease, but not for establishing the route of infection. This opinion resonated the influence of German immunologist Emil A. von Behring, who argued that all human tuberculosis was caused by ingestion of infected milk.¹⁴

For De Jong, this argument was important.¹⁵ Regarding his ideas on the unity of animal and human TB bacteria, this is understandable. After all, animal TB bacteria were mostly a danger for human infection through the ingestion of animal food products: milk and meat. Tuberculosis of the lung was seen as the most contagious form of tuberculosis in humans.¹⁶ By arguing that ingesting TB bacteria was just as dangerous as inhaling them, De Jong emphasized the danger of TB bacteria of animal origin.

In the State Committee for the control of tuberculosis, De Jong was a dedicated member of the subcommittee for the 'direct control' of tuberculosis. This subcommittee generally thought the control of TB bacteria to be essential in fighting the incidence of the disease among the Dutch population. As De Jong argued TB bacteria were lurking everywhere, in both humans and animals, he thought measures against those bacteria would be most important to control tuberculosis in the Netherlands. Another important approach in the State Committee was the 'indirect control', which focussed on strengthening the resistance of the bodies of people, including improving their social environment. As I will show in chapter 3, De Jong did not oppose the argument behind this approach. For now, I will address how De Jong's ideas on the danger of animal TB for human health were received in the subcommittee for the direct control of TB.

In general, De Jong's outspoken thesis on the danger of all TB bacteria for human health was taken serious by other members of the State Committee. Professor in pathology in Utrecht C.H.H. Spronck (1858-1932) supported De Jong in his warning that the importance of animal TB might be under-reported, for instance. He thought the numbers of infection with bovine tuberculosis had increased, as a result of growing interest for bovine tuberculosis infection in medical circles. To make a start with investigating the incidence of animal TB in the Netherlands, the subcommittee sent out an enquiry to anatomists and bacteriologists to investigate what they knew on the incidence of animal tuberculosis infections in the Netherlands, which turned out to be little. The report of the State Committee noted "tubercle bacilli of different animal species who suffer from tuberculosis" should be considered dangerous for human health. Nevertheless, the Committee did not accept De Jong's argument that *all* animals with tuberculosis posed an equal danger to human health. The State Committee thought TB bacteria stemming from birds "of almost no importance", while TB bacteria stemming from cows were thought to be most dangerous for human health. Especially food products from cows were deemed dangerous: milk and meat.¹⁷

Although De Jong thought cows were not the only animals who could spread tuberculosis, he agreed that cows and especially their milk posed a special danger regarding the spread of tuberculosis, as he explained in his special report on animal TB and food inspection for the State Committee. He had discovered cows were the most important source of tuberculosis among mammals. Milk could be infected primarily if the cow suffered from tuberculosis herself. However, milk could also easily be secondarily infected by TB bacteria spread by another tuberculous animal or human being, most importantly via their secretions and excretions like mucus from the lungs, milk, urine, and faeces. Such infected milk was an important threat to the health of its consumers. De Jong had found that calves fed with TB bacteria infected milk, became infected with

¹⁴ NA, 2.27.14 SC, inv. nr. 33, Minutes, April 16, 1920, 524; Abbo-Tilstra, *Om de sūnens*, 57.

¹⁵ NA, 2.27.14 SC, inv. nr. 33, Minutes, February 1, 1919, 99-101; February 21, 1919, 111; April 16, 1920, 523-525.

¹⁶ Abbo-Tilstra, *Om de sūnens*, 48-51.

¹⁷ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 8, 1918, 28, 30-1, 105; Roëll a.o., *Verslag*, 14.

tuberculosis without exception.¹⁸

De Jong mentioned meat as an important second bovine food product vulnerable for infection, especially with tuberculosis. As the Meat Inspection Act had been passed in 1919 in the Netherlands, the control of tuberculosis infected meat was better regulated at the time of the State Committee than the control of tuberculosis infected milk. The Meat Inspection Act made sure every animal was inspected before and after slaughtering. Inspection of milk, however, posed particular difficulties. Because of milk's delicateness, and because it was traded as a bulk product, TB infected milk was not easily retraceable to its source. Moreover, infected milk could not be easily removed from the production chain, as it mixed with the milk of other cows. "Repressive supervision", in which products of a particular animal were deemed unfit for human consumption, was therefore "unfeasible" regarding milk. This made TB infected milk a "very difficult" problem according to De Jong.¹⁹

The difference in danger felt to be posed by meat and milk, can be concluded from the discussion on the control of animal food products in the State Committee as well. The control of milk was more elaborately discussed than the control of meat. Products made of milk were not discussed as dangerous spreaders of tuberculosis. De Jong addressed them only marginally. For butter production, he advised the use of pasteurized milk. For cheese and buttermilk this was not necessary, as bacteria were killed during the process of making them.²⁰

2.3 Bacteria in the milk environment

The framing of milk diseases, especially tuberculosis and typhoid fever, as public health dangers, meant veterinarians and physicians were concerned with preventing them. As contagious diseases were generally related to germs at this time, the prevention of milk infection focussed on eliminating milk germs. Mainly the environment in which milk was produced was seen as causing the infection.

According to veterinarian H.M. Kroon infection of milk was mainly a problem of stable hygiene. Kroon (1868-1933) was professor at the veterinary school in Utrecht, in zootechnics, hygienics and knowledge of fodder, editor of the Dutch veterinary journal, and rector magnificus of the Veterinary Highschool briefly in 1921.²¹ In an address to the Society for the Protection of Infants (*Nederlandschen Bond tot Bescherming van Zuigelingen*) Kroon argued that milk would most often leave the udder without any germs, and was infected secondarily in the stable. Opportunities for infection in the stables were numerous. Kroon listed: infected cows, typhoid infected rinse and wash water, farm staff suffering from tuberculosis or typhoid fever, dust, urine. A major source of contagion was stable manure: "Mockingly, although not entirely incorrect, has been argued: cow milk is almost always a more or less diluted cow manure solution".²² Kroon thought dirty stables the most serious obstacle for the production of clean, and thus safe, milk.²³

Kroon compared the need for hygiene in stables to the need for hygiene in human society, a project which was well underway in 1920 with for instance the construction of sewerage, water works, and education in home economics at schools for girls and women. This contrasted sharply with the situation in the places of milk production, Kroon exclaimed: "The proverbial Dutch cleanliness is usually miles away in the stables and the care of animals."²⁴ He listed several

¹⁸ De Jong, 'Beteekenis', 217-8; NA, 2.27.14 SC, inv. nr. 33, Minutes, October 18, 1918, 15; November 7, 1919, 338-9.

¹⁹ De Jong, 'Beteekenis', 217, 219.

²⁰ See for instance: NA, 2.27.14 SC, inv. nr. 33, Minutes, November 21, 1919, 347-351 (on milk), 351-353 (on meat); January 10, 1919, 90; De Jong, 'Beteekenis', 220.

²¹ Offringa, *Van Gildestein*, 262-3, 324.

²² Kroon, 'De hygiëne', 207. Dutch quote: "Spottend, doch niet geheel onjuist, is gezegd: de koemelk is bijna steeds een meer of minder verdunde koemestoplossing".

²³ *Ibidem*, 205-207.

²⁴ *Ibidem*, 207. Dutch quote: "De spreekwoordelijke Hollandsche zindelijkheid is in de stallen en de verzorging der

“primitive conditions” in cow stables, like the sopping of dirty hands in the milk “to make it smooth”, and concluded: “An Augean stable can be cleaned here!”²⁵

The problem of stable hygiene was more widely recognized in circles of hygienists. Similar sources of milk infection were already discussed in a leaflet on the recognition of tuberculous cows for cattle farmers in 1905. The farmers should keep in mind the uttermost hygienic precautions of their stables and their own bodies when collecting animal material that would be researched on the presence of TB bacteria in the State Serum Institute (*Rijksseruminrichting*).²⁶ De Jong argued for improvement of stable hygiene, and elimination of tuberculous cows as the only way to prevent TB bacteria from infecting the milk. The State Committee for the control of tuberculosis advised “Promotion of the building of hygienically equipped stables for dairy cattle.”²⁷

Specific dangers of unhygienic stables were discussed in the subcommittee for the direct control of tuberculosis. For instance, the special danger posed by flies. Especially milk was thought to be susceptible for infection by flies. De Jong argued that “the fly danger” should be addressed separately in the report of the State Committee. Hygienists spoke about “the typhoid fly”, and “the TB fly” should be recognised as a problem as well. The possibility of infection of “milk or other foodstuffs” via flies was indeed addressed in the report of the State Committee. However, it also said that the ‘fly danger’ was self-evident and should not be overrated.²⁸

As infection with TB bacteria was thought to occur in many ways, the proposed measures to prevent the spread of bacteria were drastic. Mucus from tuberculosis infected lungs spread through coughing – the stereotypical tuberculosis patient is coughing up blood – was considered very important in the spread of tuberculosis. Mucus could infect people directly, via flies or handkerchiefs, or it could dry out in the form of dust, and infect people later on. Measures to disinfect and remove infected mucus were therefore thought of uttermost importance.²⁹

De Jong warned for the dangers of both human and animal mucus, for instance exchanged through coughing: “If one assumes a coughing human being can infect someone, why should one not assume this of a coughing animal as well?”³⁰ Although De Jong did not have clinical proof for his conviction, he repeated the warning several times during the meetings of the subcommittee. Coughing cows were numerous in Dutch stables, and could infect each other and humans. Infected cow mucus could infect the milk just as infected human mucus could. Fellow member Schouten agreed with De Jong about the dangers of coughing animals. He argued that birds like the domesticated chicken and canary “shake their heads strongly while coughing”, spreading their “mucus threads” “an impressive 1½ meters” far away.³¹ De Jong argued fiercely for very strict state measures against the spread of human mucus infected with TB bacteria. The government should make sure mucus from tuberculosis patients was disinfected. Moreover, the “dirty habit” of spitting in public but also in “factories, workshops, schools, railway carriages etc.” should be discouraged. De Jong also argued for medical inspection of the mucus of “chronic coughers”.³²

dieren in den regel verre te zoeken.”

²⁵ *Ibidem*. Dutch quote: “Hier valt een Augias-stal te reinigen!”

²⁶ NA, 2.19.120 RDAC, inv. nr. 6, 'Collecting disease material for the recognition of tuberculosis among cattle', publication of the Department of Agriculture, Section of Public Works, Trade and Industry, c. 1905.

²⁷ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 21, 1919, 349-351; De Jong, 'Beteekenis', 219-20; Roëll a.o., *Verslag*, 53, Dutch quote: “Bevordering van den bouw van hygiënisch ingerichte stallen voor melkvee.”

²⁸ NA, 2.27.14 SC, inv. nr. 33, Minutes, February 1, 1919, 97; Roëll a.o., *Verslag*, 18, 41.

²⁹ Roëll a.o., *Verslag*, 41-44.

³⁰ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 8, 1918, 29. Dutch quote: “Als men aanneemt dat de hoestende mensch iemand kan infecteeren, waarom zou men dat dan van een hoestend dier ook niet aannemen?”

³¹ *Ibidem*; January 10, 1919, 90; April 4, 1919, 166.

³² Most clearly his opinion can be found in a pages long memorandum for the subcommittee for the direct control: NA, 2.27.14 SC, inv. nr. 17 Nota's betreffende de bestrijding van tuberculose 1919 (Memoranda regarding the control of tuberculosis), Dirk Aart de Jong, June 1919, 238-244. See also: NA, 2.27.14 SC, inv. nr. 33, Minutes, April 12, 1919, 192-3; May 30, 1919, 323, 332.

Even more strictly, De Jong argued for the mandatory reporting of tuberculosis patients by physicians.³³ This mandatory reporting was a matter of debate in the medical world. Physicians were for instance reluctant to put tuberculosis on the list of contagious diseases, as this would damage the relation between doctor and patient, and it would discourage sufferers to seek help from a physician. After all, mandatory reporting meant 'ideally' isolation of the patient to prevent other infections. De Jong used veterinary experience with introducing mandatory reporting of contagious diseases in agriculture to argue this would also be possible for humans. The mandatory reporting would be easier in the case of animals, De Jong agreed, as no “vexatious consequences” should be feared as with humans. Moreover, farmers were used to similar measures against other diseases. With this argument, De Jong clearly showed his background in veterinary medicine. From the installation of the Veterinary State Supervision in 1870 onwards, several contagious animal diseases should be reported to veterinarians working for the government to control their spread, like rinderpest, foot-and-mouth disease and rabies. By emphasizing the need for mandatory reporting of both animal and human TB patients, De Jong again stressed his idea on the unity of human and animal tuberculosis.³⁴

De Jong used the susceptibility of milk for TB infection as a special argument for mandatory reporting of tuberculous cows. De Jong thought the Meat Inspection Act from 1919 not strict enough when the tracing and reporting of tuberculous animals were concerned. The discovery of TB infected meat during meat inspection occurred too late to prevent the spread of TB bacteria during the life of the animal. Milk was especially easily infected, and not just through tuberculosis of the udders. Mandatory reporting of tuberculous cows would mean more control over this problem.³⁵

As another important measure to prevent the spread of TB bacteria, De Jong and other proponents of the direct control of tuberculosis argued for mandatory quarantine of TB patients in hospitals and sanatoria. Among physicians, isolation of tuberculosis patients was a matter of debate for the same reasons mandatory reporting of the disease was considered problematic. Moreover, tuberculosis was a disease with a much longer duration than for instance cholera, which made isolation practically problematic. Nevertheless, the most pronounced proponents of the direct control of tuberculosis – De Jong, Scheltema, and Nolen for instance – argued for mandatory isolation.³⁶ Just as with mandatory reporting of tuberculosis, De Jong had a parallel argument on the isolation of tuberculous animals, be it more simple and drastic than in the case of tuberculous humans: “The dangerous animals should be eliminated.”³⁷

The eventual goal of all these measures was to get rid of TB bacteria from the environment of healthy humans and animals. Indeed, for people and animals already infected with TB bacteria, the case was lost in the eyes of proponents of the direct control of tuberculosis. This is vividly illustrated with their opinion on workers with tuberculosis: these people should be kept out of public spaces like hospitals, grocery shops, trains, and schools, but they should be allowed to work in tuberculosis hospitals!³⁸ Tuberculosis was controllable, but only in a TB bacteria-free environment.

³³ NA, 2.27.14 SC, inv. nr. 7 Notulen van de vergaderingen van de Staatscommissie inzake de bestrijding der tuberculose 1918-1922 (Minutes of the meetings of the State Committee on the control of tuberculosis), September 9, 1919, 18.

³⁴ NA, 2.27.14 SC, inv. nr. 33, Minutes, April 4, 1919, 172-173; November 7, 1919, 338-339.

³⁵ *Ibidem*, November 7, 1919, 338-339.

³⁶ *Ibidem*, June 13, 1919, 247-264.

³⁷ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 21, 1919, 349. Dutch quote: “De gevaarlijke dieren moeten worden geëlimineerd.”

³⁸ *Ibidem*, January 24, 1920, 433.

2.4 The first problem of pasteurisation

As milk was so easily infected with harmful bacteria, methods to kill bacteria were developed. Two procedures were available in the beginning of the twentieth century Netherlands: sterilisation and pasteurisation. Using the first method the milk was boiled for quite some time to make it sterile, bacteria free. Pasteurisation was done with lower temperatures around 60 to 70 °C, to kill most bacteria, but not all. Both methods were thought to have drawbacks.³⁹

Sterilisation was generally thought to change the character of milk in such a way, that it could not be called milk anymore. According to veterinarian Kroon, sterilisation of milk changed the constituents of milk and its digestibility fundamentally. A serious problem of sterilisation was the brown colour the milk acquired during the process. According to De Jong the problematic characteristics of boiled milk occurred when the milk was heated above 72°C. Pasteurisation was generally considered to be a good alternative. In the 1890s, physician Josef Forster developed a method to heat the milk for 25 minutes at a temperature of 65 °C, which was for instance generally used in dairies in Amsterdam.⁴⁰ However, in the succeeding years pasteurisation was criticized, for instance by De Jong.

In agreement with his battle for germ-free environments for both humans and animals, De Jong's main problem with pasteurisation was that it did not kill all the germs present in milk. In the 1900s, De Jong researched the effect of milk pasteurisation on bacteria together with pharmacist W.C. de Graaff. Firstly, they investigated the survival of coli bacteria during pasteurisation following the procedure of Forster. Not all bacteria died, which De Jong explained with the “variability” of the coli bacterium. The second step was to investigate the survival of the organisms causing the two main milk diseases: typhoid fever and tuberculosis. In 1909, De Jong presented his conclusions on the survival of TB bacteria during pasteurisation in *NTvG*, relating the issue of pasteurisation to his argument that TB bacteria in different animals were not fundamentally different. TB bacteria stemming from several animal species and humans could survive pasteurisation at 71-2 °C for half an hour. Therefore, such milk should not be allowed to be sold as “germ-free”.⁴¹

De Jong used a similar argument in the subcommittee for the direct control of tuberculosis years later. In his report on food inspection, he wrote that pasteurisation was no guarantee for the absence of TB bacteria in milk. By now, De Jong attributed a special position to TB bacteria in their ability to survive pasteurisation. He pointed at research in Sweden and Denmark which proved that pasteurisation might be successful in killing typhoid and cholera bacteria, but was not in killing TB bacteria. De Jong's own work, “hundreds of animal experiments”, had shown that pasteurised TB bacteria could remain virulent. Also in the case of (chicken) meat infected with TB bacteria, De Jong doubted whether heating in the kitchen would kill them all. As meat was a bad heat conductor, the inner temperature of meat was generally too low to kill all TB bacteria, especially during “home cooking”. The best solution to the problem of heat-resistant and ubiquitous TB bacteria was to ban tuberculosis infected animals altogether.⁴²

Although De Jong's opinion on the resistance of TB bacteria to Forster's pasteurisation was attacked in *NTvG* and in the State Committee, several colleagues shared his worries. De Jong's co-member of the subcommittee Spronck was convinced that pasteurisation did not kill “all TB bacteria”: “the more resistant, which are probably also the most virulent, stay alive.” Spronck did think pasteurised milk would be less dangerous than raw milk, as other bacteria were killed during the process. He thought a combination of TB bacteria-free milk and pasteurisation at relatively low temperatures would be safest. Veterinarian Kroon thought milk was produced in such filthy

³⁹ De Knecht-van Eekelen, *Zuigelingenvoeding*, 192-197.

⁴⁰ Van Otterloo, *Eten*, 73-75; De Knecht-van Eekelen, *Zuigelingenvoeding*, 61-62, 195; Kroon, 'De hygiëne', 207-208; D.A. de Jong, 'Pasteuriseeren van melk en het dooden van tuberkelbacillen', *NTvG* 53 (1909) 148.

⁴¹ De Jong, 'Pasteuriseeren', 147-154.

⁴² NA, 2.27.14 SC, inv. nr. 33, Minutes, November 8, 1918, 29; November 21, 1919, 349; De Jong, 'Beteekenis', 219.

circumstances, that pasteurisation would not help against all the bacteria present. Especially TB bacteria, and bacteria involved in inflammation of the mammary glands (mastitis), “or at least their traces” could be found in pasteurised milk. Milk which had been polluted during the milking process in dirty circumstances and contained a lot of micro-organisms as a result, would not be made suitable for consumption through pasteurisation.⁴³

Paediatricians worried on the effectiveness of pasteurisation in a similar way. In 1917, G.H. Moll van Charante (1872-1947) warned against the uncertain merit of pasteurisation by pointing at the presence of TB bacteria in pasteurised milk, referring to De Jong's investigations from 1908. Moreover, he warned against toxins produced by bacteria, which remained present in milk after heating, and he doubted the dead bacteria would be innocent themselves.⁴⁴ Moll van Charante's colleague Cornelia de Lange (1871-1950) shared his concerns. On “the long way from the cow udder to the stomach” bacteria could easily multiply, forming heat-resistant “toxins” harmful for a child drinking the milk. De Lange warned that “the dead bodies of bacilli” in milk were not harmless. The aim should therefore be “to prevent the bacteria from entering the milk”, rather than to kill them.⁴⁵

Worries on toxins and effects of the bodies of dead bacteria were more widespread in those years. Toxins were a much debated subject in medical circles, and were for instance thought to cause mysterious epidemics like the Spanish influenza.⁴⁶ In the US and Britain, the presence of dead bacteria in pasteurised milk was distrusted by many consumers, veterinarians and physicians alike in the early 1900s, as Jones and Atkins have shown. However, concerns like those of De Jong and Spronck that the most virulent TB bacteria would survive pasteurisation in particular, have not been documented for the Anglo-Saxon countries.⁴⁷

Milk was seen as the perfect environment for disease causing bacteria in the beginning of the twentieth century, especially for tuberculosis and typhoid bacteria. Veterinarian De Jong was the expert on animal tuberculosis in the Netherlands, and argued for far-reaching measures to eradicate TB bacteria, whether in humans or animals, especially cows. Milk infection could not just occur when cows were infected, but also by means of other carriers: other infected animals or humans handling the cows, filth in stables, flies. Even heating the milk was not thought to be sufficient to purify the milk, as for instance De Jong thought TB bacteria could survive pasteurisation temperatures. Other critics of pasteurisation thought toxins and the bodies of dead bacteria were dangerous. All those factors made milk into a substance vulnerable for bacteria invasions. On the other hand, milk was also thought to be an essential food product for a healthy body. To investigate this meaning of milk, I will turn to ideas on body resistance, constitution and healthy food in the next chapter.

⁴³ H.G. Ringeling, 'Het pasteuriseeren van melk en ziektekiemen', *NTvG* 53 (1909) 1757-9; NA, 2.27.14 SC, inv. nr. 33, Minutes, November 21, 1919, 347, 350; Kroon, 'De hygiëne', 208.

⁴⁴ Moll van Charante, 'De zorg', 798, 801.

⁴⁵ Cornelia de Lange, *De geestelijke en lichamelijke opvoeding van het kind* (later *Het kind*), (Amsterdam: Meulenhoff, 1921) 139-40.

⁴⁶ See for instance: E. Bemelmans, 'De “griep” en hare bestrijding', *NTvG* 63 (1919) 184-7.

⁴⁷ Jones, 'Mapping', 143-145; Atkins, 'The milk', 17-8.

3. Disease Resistance

In spite of milk's susceptibility for bacteria infection, it had a special meaning as a healthy food thought necessary for successful disease resistance of the human body. In this chapter, I will discuss milk in the context of ideas on disease resistance, using tuberculosis again as a particular example.

3.1 Importance of the soil

In the discussion on the control of tuberculosis, not only the TB bacterium was thought of importance. When the bacterium was the 'seed' for tuberculosis, this seed also needed a "good soil".¹ As Michael Worboys has argued on germ theories of disease in late nineteenth century Britain: "there was never a time when the 'seed' explained everything and the role of the soil was ignored".² The attention for this soil, dubbed the indirect control of tuberculosis in the Netherlands, focussed on the resistance of the body against invasion of TB bacteria. Abbo-Tilstra notes the combined attention for seed and soil in the control of tuberculosis on a local level in Friesland, but she sees the direct and the indirect directions as conflicting approaches on the national level of medical debate. I want to argue that the difference between proponents of the direct and indirect control of tuberculosis was less sharp than Abbo-Tilstra states, in line with Worboys' argument. Most participants in the Dutch debate on TB control thought both the seed and the soil of importance. The State Committee did not just have a subcommittee for the direct control of tuberculosis, but also one for the indirect control. The Committee argued for a combination of the two directions in tuberculosis control, as it thought both "the nature of infection and the resistance the body can develop against the infectant" of importance.³

One member of the subcommittee for the direct control was a strong proponent of the indirect control by improving social circumstances of the lower classes. This member was Louis Heyermans (1873-1938), physician and active in politics for the social democratic party (*SDAP*). The proponents of the direct control of tuberculosis were not amused by Heyermans' attempts to picture them as simplistic "bacteria hunters" who did not pay attention to the differences in vulnerability to tuberculosis between different social classes. They argued that they thought resistance of the body to bacteria invasion important as well. Paediatrician G.F. Scheltema feared the effects of a too sharp distinction between proponents of direct and indirect control of tuberculosis, as indirect and direct control of tuberculosis complemented each other. According to De Jong, bacteriology had always "taken into account the constitution and never denied that a natural varying resistance exists."⁴ All proponents of the direct control stressed that they thought the resistance of bodies to bacteria invasion important as well as the fight against bacteria.⁵

Resistance against TB bacteria infection was divided into several aspects by the State Committee. Social factors were most important according to Heyermans, and were generally discussed by the subcommittee for the indirect control of tuberculosis. On the other hand, the 'natural resistance' of

¹ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 8, 1918, 23.

² Michael Worboys, *Spreading germs: disease, theories and medical practice in Britain, 1865-1900* (Cambridge: Cambridge University Press, 2000) 263.

³ Abbo-Tilstra, *Om de sijnens*, 77-78 and chapter 3; Roëll a.o., *Verslag*, 13 (Dutch quote: "den aard der besmetting en den weerstand, dien het lichaam tegen de smetstof weet te ontwikkelen"); C. Dekker, 'Vergadering van de Nederlandsche Centrale Vereeniging tot bestrijding der tuberculose November 11, 1917', *Tuberculose* 14, N°1 (1918) 23.

⁴ NA, 2.27.14 SC, inv. nr. 33, Minutes, December 13, 1918, 68. Dutch quote: "rekening gehouden met de constitutie en nooit ontkend, dat er een natuurlijke wisselende resistentie bestaat."

⁵ *Ibidem*, October 18, 1918, 17; November 22, 1918, 42-3; March 14, 1919, 144-151.

the body was thought to be determined by constitution, heredity, and age.⁶ These 'natural' aspects were quite elaborately discussed in the subcommittee for the direct control of tuberculosis. Constitution was generally related to the physical quality of the body. Physical characteristics related to vulnerability for TB infection were a “less conveniently formed thorax” or a “short first rib”. One member, Fleischer, asked for attention for “the constitution of the mind”. He thought sufferers of tuberculosis were “inclined towards mysticism”, and had been “good children” during their youth. He had never seen “the rascals” getting tuberculosis.⁷

Related to the physical and psychological constitution of people was the heritability of their characteristics. The disposition for tuberculosis, or the chance to develop the disease after infection, was thought to be hereditary by many. Scheltema argued the heredity of the disposition for tuberculosis was the first cause why humanity suffered from tuberculosis. The disease itself however, could not be called hereditary, as it was a contagious disease. According to bacteriologist Nolen many experts thought the hereditary disposition for tuberculosis was a more important cause for getting the disease than exposition to the bacterium, which made heredity an important aspect of tuberculosis control.⁸

The theory of evolution and eugenetics played a role in the debate on the heredity of tuberculosis as well. For De Jong, improvement of the constitution would result in “more resistant individuals”, who would automatically get stronger and healthier descendants. He argued this against Heyermans' worries that attention for the heredity of tuberculosis would mean prohibition of unwanted marriages. Heyermans and De Josselin de Jong reacted to De Jong's opinion by arguing that acquired characteristics were not hereditary. De Jong and Spronck pointed at the likeliness of “germ damage” in reproductive cells of “weak” individuals with lower resistance against tuberculosis. An important concern was 'degeneration' of the human race. Animal breeding served as an excellent example for these ideas, as I will comment upon below.⁹

Another important part of the 'natural' resistance against tuberculosis was age. According to paediatrician Scheltema and his colleagues in paediatrics, children were especially vulnerable for tuberculosis infection. He even argued the majority and worst of clinical cases of tuberculosis should be related to early infection with the TB bacterium as a child. In this chapter's third section, the special position of child tuberculosis will be more elaborately discussed.¹⁰

Apart from 'natural' circumstances like constitution, heredity and age, social circumstances were thought to influence the resistance of the body against tuberculosis. The First World War was generally seen as having had severe consequences for the resistance of the population against tuberculosis, as the mortality had risen considerably during the war years.¹¹ Social circumstances involved for instance living conditions, poverty, and food. Heyermans was the most outspoken proponent of the need of measures in this direction to fight tuberculosis, a “disease of paupers”. He even doubted “whether the infectant is dangerous for a healthy human being living under good social circumstances.”¹² Most members of the State Committee, however, argued that TB bacteria, natural resistance and social circumstances were of combined influence.¹³

In the next section, the meaning of healthy food for disease resistance, milk in particular, will be discussed. For now, ideas on living conditions can serve as an example of the ideas on the

⁶ Roëll a.o., *Verslag*, 13.

⁷ NA, 2.27.14 SC, inv. nr. 33, Minutes, December 13, 1918, 65, 67, 74.

⁸ *Ibidem*, 70-1.

⁹ *Ibidem*, 73-4.

¹⁰ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 22, 1918, 42.

¹¹ Roëll a.o., *Verslag*, 33, 57-8; NA, 2.27.14 SC, inv. nr. 33, Minutes, January 10, 1919, 84. See also Abbo-Tilstra, *Om de sūnens*, 17, 160.

¹² NA, 2.27.14 SC, inv. nr. 33, Minutes, September 14, 1918, 6. Dutch quote: “of de smetstof voor een gezond mensch onder goede sociale omstandigheden gevaarlijk is.”

¹³ Roëll a.o., *Verslag*, 16, 59; NA, 2.27.14 SC, inv. nr. 33, Minutes, September 14, 1918, 6 and November 8, 1918, 23.

influence of social circumstances. Although the State Committee thought the exact correlation between the incidence of tuberculosis and poor housing to be unclear, she thought “being devoid of light and air of large influence” on the resistance of people. The Committee thought regulations at state level on “hygienic minimum requirements” of houses, especially regarding the availability of light and fresh air, and “slum clearance” necessary for a successful control of tuberculosis. Although an act on the minimum requirements of houses had been accepted in 1901 (the *Woningwet*), the practical consequences of this Act were unsatisfying. In general, daylight and fresh air were thought substantial elements of a healthy environment.¹⁴

The above mentioned considerations on the natural and social acquired resistance of people against tuberculosis, were addressed in similar terms as animals were concerned. Especially cows were discussed in this way, as they were producers of the product that was considered to be especially susceptible to disease infection: milk.

Infection of animals with tuberculosis was dependent on similar factors as infection of humans. Veterinarian A.J. Winkel noted for instance in De Jong's journal for comparative medicine that both TB bacteria and the animal bodies they infected could differ to such a degree, that the result could differ profoundly. The State Committee concluded that direct and indirect control of tuberculosis should be practised for cows as much as for humans. Based on “the practice of veterinary medicine”, De Jong had argued this in meetings: “Taking action against bacilli only has resulted in little improvement, but by simultaneously improving stables and resistance one has obtained good results.”¹⁵ This veterinary experience was his main argument to advocate combined attention for the direct and indirect control of human tuberculosis.¹⁶

As experimentation with people was not possible, the Report of the State Committee noted, animals should be used as models for humans to research the relative importance of disease resistance and the TB bacterium. De Jong and other bacteriologists like Nolen and Spronck were asked for such “proof from animal pathology”. Nevertheless, a complete comparison was impossible as the human situation was considered “very complicated” compared to animal testing in a laboratory.¹⁷

As the heredity of tuberculosis was concerned, De Jong based his opinion that stronger parents resulted in stronger progeny on his experience with cows as well. He pointed at “the results of cattle breeding in England, which is founded on this principle.”¹⁸ Indeed, the idea that good animal breeding could prevent cattle from getting tuberculosis was more wide spread in agriculture. Theunissen has shown that Dutch cattle breeders reacted to the problem of bovine tuberculosis by emphasizing disease resistance in their breeding programs from 1900 onwards. They even accepted that such a focus resulted in a smaller milk yield per cow.¹⁹

The hygienists concerned about the milk quality, argued disease resistance and high milk yields could and should *both* be positively influenced by breeding practices. Hereby they followed a similar reasoning as the agricultural scientists in Theunissen's studies. Veterinarian Kroon argued in his article on milk hygiene that the most important factor in producing “a lot of milk of good quality” was the responsibility of cattle breeders. In a similar way, paediatrician Moll van Charante

¹⁴ Roëll a.o., *Verslag*, 68-69; Schuurmsma, *Jaren*, 22.

¹⁵ NA, 2.27.14 SC, inv. nr. 33, Minutes, April 16, 1920, 517. Dutch quote: “Met optreden tegen de bacillen alleen heeft men weinig verbetering gebracht, maar door gelijktijdige verbetering in de stallen en verhooging van den weerstand heeft men goede resultaten verkregen.”

¹⁶ A.J. Winkel, 'Het voorkomen van tuberkelbacillen in het bloed en de melk van het rund; de beteekenis hiervan uit een wetenschappelijk en uit een hygiënisch oogpunt', *Tijdschrift voor Vergelijkende Geneeskunde* 3 (1918) 269; Roëll a.o., *Verslag*, 20; NA, 2.27.14 SC, inv. nr. 33, Minutes, April 16, 1920, 517. See also Abbo-Tilstra, *Om de sūnens*, 201.

¹⁷ Roëll a.o., *Verslag*, 13, 16; NA, 2.27.14 SC, inv. nr. 33, Minutes, October 18, 1918, 15, and December 13, 1918, 68-9.

¹⁸ NA, 2.27.14 SC, inv. nr. 33, Minutes, December 13, 1918, 73.

¹⁹ Theunissen, 'Een mooie koe', 47-61; Theunissen, 'Breeding', 642-53.

discussed the perfect cows for milk production: those did not suffer from tuberculosis, and gave a lot of fat-rich milk. Such cows should be obtained by a good breeding program, in the ideal situation by the owner of the farm himself.²⁰

Moreover, the amount and quality of milk produced by a cow was influenced by her environment. Moll van Charante noted for instance that cows produced less milk when the weather was bad. Apart from such natural influences, factors comparable to the social circumstances of humans were discussed as having influence on the health of cows and the quality of their milk as well. The need for clean, bacteria-free stables as expressed by hygienists has already been discussed in the preceding chapter. Such requirements were always accompanied by calls for the presence of daylight and fresh air in stables, echoing similar concerns about the living conditions of people. Kroon described cow stables as being “badly equipped, too small, far too dark, far too low, badly ventilated”, and as lacking facilities to get rid of faeces and urine.²¹ Similar concerns for the presence of light and air in stables were voiced by paediatricians and other veterinarians. On the beneficial influence of pasturing Moll van Charante noted that “the bacteria killing influence of sun beams is important.”²² De Jong pointed at the importance of outside grazing as well, as it would slow down TB infection of calves.²³

Having discussed the main general ideas on disease resistance of both humans and animals, I will now turn to the special role attributed to milk in the resistance of bodies to disease infection.

3.2 Healthy milk

Milk itself was seen as a central food for strengthening the resistance of the body against disease. Increasing concerns on the dangers of disease infection via milk did not destroy this image of milk as an essential food. Indeed, milk was seen as a self-evident part of a healthy diet. Physician G.F. Gezelle Meerburg argued for instance in 1923 that milk should be given more explicit credits for its healthy characteristics.²⁴ In this section, I will investigate the reasons why milk was considered healthy, especially for 'weak' members in society.

After 1850, food of the lower class in society had become more and more the subject of medical debate in the Netherlands. One of the first physicians who worried about the quality of the food of the poor was Gerrit Jan Mulder, who argued their diet of potatoes was too low in proteins. He advised beans as an alternative source of proteins for those who could not afford meat, fish and dairy products. Around 1880-1890 laborers could afford to eat a more varied diet, containing dairy products like milk, buttermilk, and butter. In 1905, physician Moquette investigated the diet of laborers in Utrecht, in which milk was consistently present.²⁵

During the latter decades of the nineteenth, and in the beginning of the twentieth century, proteins and aminoacids were subject of debate in international scientific circles. The constituents of proteins, aminoacids, were discovered by the German chemists Emil Hermann Fischer and Franz Hofmeister. In 1911, the Americans Thomas Burr Osborne and Lafayette Benedict Mendel presented their findings on essential aminoacids: foods of animal origin contained aminoacids essential for human health which vegetable foods like corn, wheat and oats did not. Dutch physicians interested in the subject, like Cornelis Pekelharing and Hartog Hamburger, relied mainly on German research,

²⁰ Kroon, 'De hygiëne', 204; Moll van Charante, 'De zorg', 793.

²¹ Kroon, 'De hygiëne', 206.

²² Moll van Charante, 'De zorg', 796. Dutch quote: “de bacteriedoodende invloed van de zonnestralen is zeker niet gering te achten.”

²³ *Ibidem*, 791, 799-800; De Lange, *Het kind*, 140; C.F. van Oyen, 'De productie', 15; NA, 2.27.14 SC, inv. nr. 33, Minutes, October 18, 1918, 15.

²⁴ G.F. Gezelle Meerburg, 'Het gebruik van melk in de behandeling van zieken', *NTvG* 67 (1923) 249.

²⁵ Van Otterloo, *Eten*, 38-41, 49

and complained that the Dutch medical profession was not interested in the subject.²⁶

The Amsterdam medical professor R.H. Saltet noted in his hygienist text book of 1913 on the importance of animal proteins in meat and milk: “In general, animal proteins are of larger value than vegetable proteins”.²⁷ Milk was a relatively cheap source of these essential animal proteins. Mainly infants and children benefited from them, as milk was not a “major food” for adults. Nevertheless, Saltet did think milk could be a major contribution to the diet of 'weak' laborers. Serving laborers milk in an old sugar refinery in Amsterdam had “positive results, also on labouring in the factory.”²⁸

The State Committee for the control of tuberculosis argued that healthy food was of great importance in preventing and controlling tuberculosis, as it strengthened the resistance of the human body against tuberculosis. Milk had a special position in this healthy diet. The TB prevention clinics (*consultatiebureaus*), institutes that should be installed to monitor and treat tuberculosis in society according to the Committee, should be able to distribute food to sufferers, especially milk.²⁹

The healthiness of milk got a new dimension in the 1920s, when vitamins became seen as important constituents. Vitamin research is relatively recent compared to protein research. In the late nineteenth century, the disease *polyneuritis* or beriberi was researched by the Dutch physician Christiaan Eijkman in the Dutch East Indies. While Eijkman was looking for some kind of bacterium, he found the cause of a similar disease in chickens to be a difference in rice fed – whole, uncooked rice did not cause polyneuritis gallinarum, while white, cooked rice did. Eijkman then thought of a toxic substance in the rice grains as the cause of the disease. The work of Eijkman was continued by Adolphe Vorderman and Gerrit Grijns in the Dutch Indies. They found and argued that the cause of beriberi was a deficiency: whole rice contained an essential nutrient which white rice did not contain. The Polish biochemist Casimir Funk argued that beriberi, scurvy and related diseases should be attributed to “deficient substances” in food in 1912. He introduced the word vitamins for those substances, as they had an amino-structure, and were thought to be essential for a healthy life.³⁰

In the Netherlands, physician E.C. van Leersum, specialised in dietetics, was a major voice in the debate on the importance of vitamins in food. He founded the Dutch Institute for Popular Food (*Nederlandsch Instituut voor Volksvoeding*) in Amsterdam in 1919, with a “vitamin lab” attached.³¹ Milk attracted his special interest for the vitamins it contained. Van Leersum argued that the presence of vitamins in milk had illuminated “the great importance of this food for the growing organism, which was already known from experience”.³² Moreover, milk was an essential food for the sick, as it was nutritious, easily consumed, and easily digested. As groups in society who relied most importantly on milk, Van Leersum mentioned: infants, children, pregnant and breastfeeding women, the sick, “the weak” and recovering people. Van Leersum pointed out that milk in its “original, natural and physical-chemical state” did not just contain proteins, minerals, fats and carbohydrates, but 'living' components like “ferments, enzymes, complements and vitamins” as well.³³

Despite this strong image of milk as food for 'the weak', it increasingly became a healthy food for everyone during the first decades of the twentieth century. Illustrating is the change in use of the slogan ‘milk is good for everyone’ (*melk is goed voor elk*), a slogan every Dutch person still knows

²⁶ De Knecht-Van Eekelen, *Zuigelingenvoeding*, 51-58.

²⁷ R.H. Saltet, *Voordrachten over Gezondheidsleer* (Haarlem: De Ervan F. Bohn, 1913) 339. Dutch quote: “In het algemeen is dierlijk eiwit van grooter waarde dan plantaardig”.

²⁸ *Ibidem*, 352 (quote), 355, 371.

²⁹ Roëll a.o., *Verslag*, 115.

³⁰ De Knecht-Van Eekelen, *Zuigelingenvoeding*, 62-69.

³¹ A. de Knecht-van Eekelen, 'Het vitaminen-laboratorium', *Gewina* 19 (1996) 43-46.

³² Van Leersum, 'Pure Melk', 2-3.

³³ *Ibidem*, 3.

today. Originally, the saying was, according to the famous seventeenth century Dutch poet and statesman Jacob Cats: “Milk on top of wine / that is poison, / but wine on top of milk / is good for everyone.”³⁴ Probably Cats meant this quite literally as a health advice, as the poem was part of a collection of health advices. In the nineteenth century, the writer of a collection of Dutch sayings P.J. Harrebomée understood Cat’s poem differently. He argued the saying had the symbolic meaning that a household should be started with simple means (milk) in order to end rich and successfully (wine). Some people, Harrebomée added, understood the saying literally as a “health measure”, but he thought this unlikely. In Harrebomée’s meaning, milk was clearly representative of the poor lower classes – ‘the weak’.³⁵

From 1900 onwards, the saying reappeared in a slightly adjusted version already mentioned: ‘milk is good for everyone’. This was an advertisement slogan of the dairy industry to stimulate the consumption of milk. The phrase was for instance printed on stoneware, and appeared in newspaper advertisements, with a peak in the 1920s and 1930s. In this version, milk was presented as a healthy food for everyone. Although the physician C.J. Brenkman questioned the benefits of the use of milk by healthy adults in one of those newspapers, and argued the saying should be confined to address children, this rise in advertising seems to point at a general shift in the popular understanding of milk as a product only for ‘the weak’ to a product beneficial for everyone.³⁶

A colourful source to illustrate the growing meaning of milk as a healthy product for the population at large, is an ironic pamphlet *against* the consumption of milk, written by the avant-garde artist with fascist sympathies Erich Wichmann (1890-1929). Wichmann (also known as Wichman) published his pamphlet ‘The white danger’ (*Het witte gevaar*) in 1928. The pamphlet was equally meant like as an argument in favour of alcoholics, as it was meant an attack on milk. Wichmann ridiculed the drinking of milk as a sign of the weakness, childishness and decadency of the Dutch people, which would perish from epidemics because of such “calfization” (*verkalving*). On the high mortality during the ‘Spanish’ influenza pandemic of 1918-1920, he commented: “influenza 1918, *all* milk drinkers”.³⁷ He abhorred advertisements with the phrase ‘milk is good for everyone’ on stoneware, the back of Utrecht tram tickets, and in dairies. Milk was only good for calves, and “maybe quite harmless” for “people in a more or less calf-like state” like babies, the sick and weak, recovering people, and “possibly [...] even some women”.³⁸

Wichmann’s attack on milk as a food used by the population at large, is evidence for the growing acceptance of milk as a healthy drink for everyone. In 1937, school milk was introduced, after British example, to strengthen the resistance of children. In 1938, the General Society for Milk Supply (*Algemeene Vereeniging voor Melkvoorziening*) described milk as “ideal food” for humans in general, although it still emphasised its special value for children, the elderly, and sick and weak people. Keeping in mind that this positive opinion on milk was voiced by its dealers, it nevertheless reveals something on the general nutritious values ascribed to the liquid.³⁹ In 1941, veterinary

³⁴ In Dutch the poem says: “Melck op wijn / Dat is venijn, / Maer wijn op melck / Is goet voor elck”. Jacob Cats, ‘By-spreucken, en Gront-regels tot onderhoudinge of verbeteringe der ghesontheit’, *Klagende maeghden en raet voor de selve* ([Dordrecht: Matthias Havius,] 1633) 140. Accessed via DBNL.org: http://www.dbnl.org/tekst/cats001klag01_01/cats001klag01_01_0028.php (August 30, 2012).

³⁵ P.J. Harrebomée, *Spreekwoordenboek der Nederlandsche taal II* (Hoevelaken: Verba, 1990 [1858-1862]) 293. Accessed via DBNL.org: http://www.dbnl.org/tekst/harr001spre01_01/harr001spre01_01_0071.php (July 19, 2012).

³⁶ Anonymous, ‘Decor: Melk is goed voor Elk’, *Decoraties Maastrichts Aardewerk, 1836-1969* of the Social Historical Centre of Limburg. Accessed via *Het geheugen van Nederland*, www.geheugenvannederland.nl (July 4, 2012), under the search term ‘melk is goed voor elk’. For advertisements, I used the online newspaper database of the Royal Library and its filter on years: kranten.kb.nl, under the search term ‘melk is goed voor elk’; C.J. Brenkman, ‘Drink meer melk!’, *Algemeen Handelsblad* (August 28, 1925, morning) 6.

³⁷ Erich Wichman, *Het witte gevaar: over melk, melkgebruik, melkmisbruik en melkzucht* (Maastricht: Leiter-Nypels, 1928) 23. Emphasis in original.

³⁸ *Ibidem*, 14-15, 16 (note), 19-20; I. Schöffner, ‘Wichmann, Erich (1890-1929)’, in *Biografisch Woordenboek van Nederland*, February 10, 2012, <http://www.historici.nl/Onderzoek/Projecten/BWN/lemmata/bwn4/wichman> (July 4, 2012).

³⁹ De Knecht van Eekelen and De la Bruhèze, ‘De witte moter’, 317-8; NA, 2.11.06 Directie van de Landbouw:

professor in foodstuffs of animal origin C.F. van Oyen (1885-1962) argued in his book *Milk* that the animal proteins found in milk were important for “the maintenance of the organism” and improved “the power of work”.⁴⁰ He predicted the consumption of milk would rise.

This was true to some extent. The milk consumption per head of the population rose remarkably during the 1940s as compared to the 1930s. The slogan 'milk is good for everyone' was generally endorsed by housewives in the late 1950s.⁴¹ Nevertheless, the milk consumption started to decline during the 1950s.⁴² The dairy industry reacted with well-funded advertisement campaigns, like the 'Milk squad' (*Melkbrigade*) and the cartoon figure *Joris Driepinter*, in which the healthiness of a lot of milk was emphasized. This image of milk was a consequence of decades of chemical and medical research showing that milk was a particularly healthy food. In the next section I will illuminate the special position of infants and children regarding milk consumption.

3.3 The special position of the young

Milk was generally thought to be a central food for infants and children, as has become clear already. Cow milk, naturally produced for calves, was connected to motherhood. Children were thought to be its most important consumers. For infants, consumption of milk was considered absolutely necessary: “As concerns the infant, the value of milk needs no elucidation. It is the only source from which the infant can draw everything its organism needs.”⁴³ Older children were thought to mainly grow on milk. In this section I will discuss the close relation between children and milk.

The growing attention for cow milk as food for children fits into the expansion of the field of child medicine during the late nineteenth century and the beginning of the twentieth century in a wider European context. In the Netherlands, the special concern for the health of children started in the second half of the nineteenth century with privately funded child hospitals. In 1892, the Dutch Society for Paediatrics (*Nederlandsche Vereeniging voor Paediatric*) was founded, in 1906 followed by the Society for the Protection of Babies. Cornelia de Lange (1871-1950), the first female professor at the Amsterdam medical faculty, and her tutor, the progressive gynaecologist Hector Treub, were members. In both societies, infant and child food was an important topic. Infant welfare centres (*consultatiebureaus*) were founded from the first decade of the twentieth century onwards, so paediatricians could keep track of the food, growth and health of children. In 1909, G. Scheltema (1864-1951) became the first professor in paediatrics, in Groningen. We have already met him as a member of the State Committee on tuberculosis. He was a central member of the Dutch Society for Paediatrics.⁴⁴

Already during the nineteenth century, physicians had been advocating breast feeding as the most natural and healthiest food for infants, as a reaction to widespread practice of 'artificial' feeding with animal milk or porridge. Physicians based their advice for breast feeding mainly on statistical data showing infants who got breast feeding had a higher chance of survival than babies

Zuivelaangelegenheden 1914-1947 (Secretariat of Agriculture: Dairy Affairs, later DA), inv. nr. 8 Melkkwesties 1925-1940 (Milk questions), G.J. Blink a.o., *Beschouwing over en 1e jaarverslag van de Algemeene Vereeniging voor Melkvoorziening 1938/39* (Considerations on and first annual report of the General Society for Milk Supply 1938-39), 10.

⁴⁰ C.F. van Oyen, *Voedingsmiddelen van dierlijke oorsprong: Melk* (later: *Melk*) (Utrecht & Amsterdam: J. van Boekhoven, 1941) 353.

⁴¹ De Knecht van Eekelen and De la Bruhèze, 'De witte moter', 317-21.

⁴² Reliable data on the consumption of milk in the Netherlands is only available from the second half of the 1930s onwards: A.P. de Knecht van Eekelen and A. Albert de la Bruhèze, 'De witte moter', 318, graph 6.1.

⁴³ Van Leersum, 'Pure melk', 3. Dutch quote: “Wat den zuigeling betreft, behoeft de waarde van melk niet te worden toegelicht. Zij is voor hem de eenige bron, waaruit hij al wat zijn organisme noodig heeft kan putten.”

⁴⁴ De Knecht-van Eekelen, *Zuigelingenvoeding*, chapter 3.

who were 'artificially' fed. In the 1890s, several components of mother milk were discovered, like antitoxins and specific enzymes. These components confirmed the status of mother milk as an essential, 'living' food for infants. In the beginning of the twentieth century, a majority of mothers followed the advice of their doctors to breast feed their children.⁴⁵

De Lange voiced the ideals of naturalness, life and health surrounding mother milk extensively. Babies who were not fed with mother milk would “wilt as a plant that lacks sun light”, and would not survive “a powerful gust of wind”. Mother milk was a “living liquid”, produced especially for the infant. “*The milk of the own mother* is a magic potion”, which would “adjust itself to the peculiarities of an infant”. Mother milk contained substances to protect the infant against contagious diseases, to strengthen its resistance, to stimulate digestion, and to let it grow well. The food was irreplaceable.⁴⁶ The similarities between the positive qualities of mother milk and those of cow milk discussed earlier are profound. Both are 'living liquids', contain several healthy substances and are easily digestible. Both human mothers and cows were natural producers of living, healthy milk. However, the qualities of milk were species-specific: when infants were concerned, mother milk was preferred above milk of cows. Feeding infants with cow milk was considered 'artificial' and less healthy.

Nevertheless, not all mothers were able or willing to breast feed their infants, or to continue breast feeding for a longer time. For these infants, a substitute of mother milk was needed. Nineteenth century physicians had advocated donkey milk as the best substitute for mother milk, due to its chemical content, and due to the fact that donkeys (and goats) were thought not to suffer from tuberculosis. This turned out to be wrong, moreover donkeys produced less milk for human consumption than cows. (Moll van Charante remarked that in this sense also donkeys were stubborn animals.⁴⁷) In the twentieth century the use of donkey milk was abandoned, and cow milk became the most common substitute for mother milk.⁴⁸

For older children, cow milk was considered very healthy without doubt. Their large milk consumption made children especially vulnerable for infection with tuberculosis through infected milk. Anglo-Saxon research, on which Dutch physicians and veterinarians were often relying, showed bovine TB bacteria could cause tuberculosis of the intestines, glands, skin, bones and joints in children.⁴⁹ When this high incidence of bovine tuberculosis infection among children was discussed in the subcommittee for the direct control, Spronck noted the central role milk played in the spread of tuberculosis among children.⁵⁰

In general, the attention for children in the control of tuberculosis was rising. Nelleke Bakker has discussed the changes in the image of tuberculosis among physicians in the first decades of the twentieth century, as a result of the growing attention for child medicine. From a disease that was related to adults, physicians focused more and more on the prevention of tuberculosis in young

⁴⁵ *Ibidem*, chapter 8, especially 227-228.

⁴⁶ De Lange, *Het kind*, 123-124. Although this book was an adaptation of the German textbook *Das Kind* by Ph. Biedert, De Lange notes in her preface (pp. 1-2) that she adjusted the chapter on baby food to her own insights, especially the section on artificial food. This chapter is therefore reliable to discuss De Lange's view on infant feeding with mother milk and cow milk. De Lange phrased the value of mother milk like this in Dutch: “Zij [babies die geen moedermelk krijgen] kwijnen als een plant, die het zonlicht ontbeert, die opgekweekt is in een vertrek met kunstlicht, en die, naar buiten verplaatst, niet opgewassen is tegen een krachtigen windstoot. *De melk van de eigen moeder* is een tooverdrank, die zoo gemakkelijk is te verkrijgen, maar helaas, zoo vaak niet wordt gegeven; zij is door niets te vervangen [...]. De melk is als het ware een levende vloeistof, die ter wille van het kind wordt gevormd, die zich aanpast aan de eigenaardigheden van een zuigeling”.

⁴⁷ Moll van Charante, 'De zorg', 788.

⁴⁸ De Knecht-van Eekelen, *Zuigelingenvoeding*, 167-183. See also: De Lange, *Het kind*, 138.

⁴⁹ Jones, 'Mapping', 134-135; NA, 2.27.14 SC, inv. nr. 33, Minutes, November 8, 1918, 28-30. Heynsius van den Berg referred for instance to the British physician Louis Cobbett, who published *The causes of tuberculosis* in 1917. Dirk Aart de Jong had of course a more radical view, as I discussed in chapter 2: a distinct bovine tuberculosis bacterium did not exist, and he thought it possible that ingestion of TB bacteria caused pulmonary tuberculosis.

⁵⁰ NA, 2.27.14 SC, inv. nr. 33, Minutes, February 1, 1919, 103.

children. This development occurred not only in the Netherlands, but in a wider European context. The prevention or treatment of tuberculosis in children was thought to be established through a combination of healthy food, a healthy and clean environment, and rest.⁵¹

In the State Committee, Scheltema was the expert on child tuberculosis. He tried to convince the other members that tuberculosis should mainly be seen as a childhood disease, and that most adult tuberculosis could be related to infection during childhood. Moreover, he suspected that tuberculosis was more dangerous during childhood. The State Committee did not agree with these statements. The issue was simply considered too complicated to follow Scheltema's argument without comment. Scheltema voiced his discontent in a separate memorandum attached to the official report of the State Committee.⁵² According to Bakker, Scheltema's thesis that tuberculosis should be considered a child disease was not taken seriously by the State Committee, which she attributes to "the fact that a majority of the physicians in the committee still believed in a hereditary predisposition".⁵³ However, Scheltema's point that children with tuberculosis should be given distinct attention as an important group of patients, was not denied by the Committee. I will analyse ideas on child tuberculosis in comparison with ideas on disease in cows to illuminate this thesis.

The State Committee argued in its report that children were probably more sensitive to TB infection than adults, based on results from animal experimentation. Most commonly, the report said, the first infection with tuberculosis would take place during childhood, although it depended on the nature of the infection and the resistance of the child whether it would truly develop tuberculosis. De Jong argued that although young animals were easily infected with tuberculosis, they were not necessarily worse off than older animals. The tubercles they developed were generally not wider spread through the body, and they did not suffer from higher mortality. Measures against infection of children were considered important, nevertheless. De Jong argued for instance that early diagnosing of tuberculosis in children by well-educated and provided school doctors and infant welfare centres was of great importance.⁵⁴

Isolating children from their tuberculous family in foster families or "institutions" (often for good) was called the "system Grancher", after the French physician J.J. Grancher (1843-1907). Especially Scheltema thought this system was an important measure to prevent infection of children. An important aspect of isolating children was the possibility of a healthy stay in sunshine and fresh air. Several possibilities to send children to the city edge or the countryside were developed: health colonies or hosting farmers' families for children who were too 'weak' to go to school, but not ill enough to go to hospitals, and 'open air schools' to provide children with a continuous healthy environment. School doctors were instructed to inspect children's health and to ventilate classrooms regularly.⁵⁵ Scheltema did not consider bovine tuberculosis the most important danger for the TB infection of children, although he argued it should not be neglected.⁵⁶ Nevertheless, the reasoning behind the open air schools and health colonies he advocated, was much like the reasoning De Jong and others voiced on the ideal environment for the prevention of TB infection among young cattle: fresh air and sunlight in pastures.⁵⁷

One of the concerns regarding the risk of TB infection of children were schools. In the Netherlands, compulsory education had been introduced in 1901. From 1904 onwards, schools

⁵¹ Nelleke Bakker, 'Fresh air and good food: children and the anti-tuberculosis campaign in the Netherlands c.1900–1940', *History of Education* 39 (2010) 343–361; Abbo-Tilstra, *Om de sūnens*, 237.

⁵² G. Scheltema and D. van Dorp-Beucker Andreae, Untitled memorandum on tuberculosis as child disease, Roëll a.o., *Verslag*, 16, 153-63; NA, 2.27.14 SC, inv. nr. 33, Minutes, November 22, 1918, 42-51.

⁵³ Bakker, 'Fresh air', 351, 352 (note 44, quote), 355.

⁵⁴ Roëll a.o., *Verslag*, 16, 19; NA, 2.27.14 SC, inv. nr. 33, Minutes, November 22, 1918, 49-51; February 21, 1919, 125.

⁵⁵ Bakker, 'Fresh air', 348-357; the journal *Tuberculose* paid particular attention to this issue, for instance: Anonymous, 'Verslag der Handelingen van de Centrale Commissie voor uitzending van Ned. Kinderen naar buiten', *Tuberculose* 15 (1919) 82.

⁵⁶ Bakker, 'Fresh air', 347, note 19; Roëll a.o., *Verslag*, 158, 162 (foot note 1).

⁵⁷ Bakker, 'Fresh air', 354-60; NA, 2.27.14 SC, inv. nr. 33, Minutes, October 18, 1918, 15.

started to appoint school medical officers, as contagious diseases threatened the gathered children. School doctors saw tuberculosis as their main enemy, as it was the most lethal school disease.⁵⁸ Teachers were also increasingly seen as a health risk at schools. The State Committee argued for better control of tuberculous personnel at schools. This concern mirrors the concerns over infected personnel handling animals and milk at farms.⁵⁹

The parallels between cows and children can be found in more places. De Lange pointed out the importance of a healthy environment to prevent children from getting tuberculosis, mirroring the conditions she prescribed for cow stables, most importantly light and fresh air. She also pointed out the hereditary character of the predisposition for tuberculosis, and argued that – ideally – sufferers from tuberculosis should not get children.⁶⁰ In general, sensitive children and calves should be subjected to similar hygienic regimens and environments, to prevent them from catching nasty bacteria and to strengthen their resistance.

Another example is the discussion in the subcommittee for the direct control of tuberculosis on infection via the mother during pregnancy, and in the first year of an infant. Comparisons between cows and women were used in this discussion, again confirming the meaning of motherhood surrounding cows. De Jong argued that young calves often showed “congenital tuberculosis”, and this meant human congenital infection might happen more often than was generally acknowledged in clinical medicine. Again, De Jong argued against Scheltema that this did not mean tuberculosis infection was more dangerous for young animals, as older calves with signs of congenital infection survived. Spronck also thought congenital infection via the infected blood of the mother probably happened more often than was generally accepted. Interestingly enough, Scheltema did not think infection of an infant in the womb was of importance.⁶¹

An interesting parallel between infants and calves concerned milk explicitly. De Jong was interested in the milk of tuberculous mothers with healthy breasts: did their milk contain TB bacteria? “For animals this is still a point in question.” Heynsius van den Berg answered that those women had TB bacteria in their milk, and that infection with “tuberculosis meningitis” possibly occurred more often during breast feeding than during feeding with cow milk. Spronck and Scheltema confirmed the dangers of tuberculous mother milk. Particularly female organs seem to have been thought to excrete bacteria easily. Veterinarian Winkel argued that several organs of cows could excrete TB bacteria without showing any tubercles, especially the udders.⁶²

3.4 The second problem of pasteurisation

The nutritious components of milk were found to be damaged by heating. Because milk needed heating as it was found to be so easily infected with bacteria, this served a problem. The very procedure necessary to eradicate milk's many bacteria, destroyed its essential nutrients at the same time. As De Knecht-Van Eekelen has shown, these worries were already voiced in the 1890s, when new chemicals called “antigenes, antitoxins, and enzymes” were discovered in raw milk. It was even argued that fresh milk had bacteria-barring characteristics. In 1890, hygienist A.P.F. Fokker presented research results that implied that milk had “antiseptic characteristics”, as the number of bacteria in milk *declined* in the first hours after milking. Also, it was discovered that immunity was transferable via mother milk. Milk was seen as a “living” liquid, which lost this essence through heating.⁶³

Infants were thought to be especially vulnerable for the disadvantages of heated milk, as

⁵⁸ Bakker, 'Fresh air', 349-357.

⁵⁹ Roëll a.o., *Verslag*, 150.

⁶⁰ De Lange, *Het kind*, 212.

⁶¹ NA, 2.27.14 SC, inv. nr. 33, Minutes, January 10, 1919, 85-89; Roëll a.o., *Verslag*, 18.

⁶² NA, 2.27.14 SC, inv. nr. 33, Minutes, January 10, 1919, 89-90; Winkel, 'Het voorkomen', 294.

⁶³ De Knecht-Van Eekelen, *Zuigelingenvoeding*, 196-7.

they relied on milk as their only food. Physicians noted in the late nineteenth century that children of higher class parents who were fed with bacteria-free sterilised cowmilk developed a disease. The British physician Thomas Barlow related this disease to scurvy in adults, and saw its cause in the use of 'preserved food'. He prescribed 'living foods' like fresh vegetables and raw milk as a therapy, and his patients recovered quickly. Why this therapy worked was unknown. On the continent, physicians were not immediately convinced of Barlow's diagnosis and therapy. A substantial group argued some unknown bacterium or its toxins were causing the disease, revealing the dominant reliance on the new bacteriology in those years. The physicians W. Nolen, E.G.A. ten Siethoff, M. Denekamp and A.A. Hijmans van den Bergh were involved in this early debate on Barlow's disease in the Netherlands. As the dangers of bacteria infection via milk were well-known and feared, the heating of milk took place on a larger scale and Barlow's disease became a bigger problem. Physicians accepted that the therapy with fresh food worked, and kept emphasizing the importance of 'natural' breast feeding. Once vitamins were discovered, paediatrician J.C. Schippers advocated the importance of vitamins for children and babies. Around 1920, the relation between several deficiency diseases – like Barlow's disease – and vitamins was generally acknowledged.⁶⁴

During the first decades of the twentieth century, the rise in pasteurisation of milk by the dairy industry as a solution to the threat of milk bacteria was cause for concern among physicians, in the Netherlands as well as in an international context.⁶⁵ The health council of the municipality of The Hague, for instance, wrote to its local government about concerns over a decline in availability of raw milk for children due to a rise in pasteurisation. The local council mainly worried about the risk of Barlow's disease for infants. The commission mainly worried on the effects of a decline in availability of raw milk for the “better situated”, as they bought their milk more often from pasteurizing dairies. The local government should make sure the indications about the freshness of milk on its packaging should be truthful, and the people should be informed of the need for raw milk.⁶⁶ According to De Lange “heating the milk results in changes, transforming her from a 'living' into a dead liquid.”⁶⁷ The commission for Social Hygiene of the Dutch Society for the Advancement of Medicine (*Nederlandsche Maatschappij tot Bevordering der Geneeskunst*) thought the negative effects of both sterilisation and pasteurisation, especially for infants, to be “common knowledge” in 1926.⁶⁸

Also in the meetings of the State Committee on tuberculosis concerns on the effects of pasteurisation on the nutritional value of milk were voiced. Pijnappel worried about the heating of both milk and meat, as it would destroy their vitamins.⁶⁹ Nolen thought this hardly relevant, as people ingested vitamins via other food, but Pijnappel argued “that the people can not do without so many vitamins.”⁷⁰ In these kinds of discussions, De Jong continuously pointed at the uncertain merits of pasteurisation in killing harmful bacteria. He did not think the best solution to his discovery that TB bacteria were heat-resistant would be to raise the pasteurisation temperatures. Higher temperatures would mean milk with the negative characteristics of sterilised milk. De Jong thought especially the destruction of proteins problematic.⁷¹ Although the Committee in general argued for stricter control of pasteurisation practices, it also thought the availability of raw milk for infants necessary, “for several reasons, not concerning tuberculosis in particular”.⁷²

⁶⁴ *Ibidem*, 161-165.

⁶⁵ Jones, 'Mapping', 143-5; Atkins, 'The pasteurisation', 37-48.

⁶⁶ NA, 2.15.37 DPH, inv. nr. 329 Stukken betreffende de totstandkoming van het KB 23-06-1925 (no.256) tot toepassing van de artikelen 14 en 15 van de Warenwet op melk (Melkbesluit) 1921-1926 (Papers regarding the realisation of the milk decree), Letter Health Council of The Hague to the local government, October 26, 1921, 2.

⁶⁷ De Lange, *Het kind*, 143. Dutch quote: “heeft verhitting van de melk veranderingen tengevolge, die haar van een 'levende' tot een doode vloeistof maken.”

⁶⁸ Horst a.o., 'Melkbesluit', 495.

⁶⁹ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 7, 1919, 342-3.

⁷⁰ *Ibidem*, 343. Dutch quote: “dat het volk niet zooveel vitaminen missen kan.”

⁷¹ De Jong, 'Beteekenis', 219; NA, 2.27.14 SC, inv. nr. 33, Minutes, November 21, 1919, 349.

⁷² Roëll a.o., *Verslag*, 51. Dutch quote: “om verschillende redenen, niet speciaal de tuberculose betreffende”.

In the 1920s, Van Leersum became especially interested in the harmful effects of pasteurisation. In an article in *NTvG*, he described his research concerning the presence of vitamin C in milk, raw and pasteurised. Van Leersum had “no doubt” heating damaged the nutritious value of milk. It was “denatured” through heating. The molecular structure of proteins, and minerals was changed. Also vitamins were prone to damage through heating, especially when oxygen was present, Van Leersum concluded from his research.⁷³ Van Leersum thought the risk of milk infection simply too high to provide everyone with raw milk, however. Therefore, “heated, be it 'dead' milk” was “preferable above raw 'living' but dangerous” milk when healthy adults were concerned.⁷⁴ For poor social groups however, Van Leersum thought the negative effects of heating the milk too large. As cereals were “deliberately deprived of their vitamin-containing parts”, butter was replaced by “artificial'-butter which does not contain vitamins”, and the consumption of conserved foods was rising, people would ingest too few vitamins. “Too much is missing from the food, especially concerning the young growing individual and the poor, to make it not a pity to deprive such an excellent food as milk of a major part of its nutritious value.”⁷⁵ This made the damaging of milk's nutritious value through heating a matter of social and moral concern.

Milk was seen as an essential food product for a healthy body and successful disease resistance, especially for 'the weak' among the population, meaning young and elderly people, sick people, and the lower, poor classes in society. For infants, mother milk was considered best, and cow milk second-best. Children were thought to be the main victims of bovine tuberculosis, as they consumed a lot of milk. Milk's connectedness to child- and motherhood were visible in similar ideas on children and calves regarding their susceptibility for tuberculosis, and how infection should be prevented. The beneficial, 'living' components of milk were thought to be delicate. The presence of both bacteria and delicate nutrients in milk was turned into a paradox: the first could be battled by heating the milk during pasteurization, while the second were destroyed through this 'artificial' treatment. Some physicians and veterinarians proposed so-called 'model milk' as a solution to this problem.

⁷³ E.C. van Leersum, 'Over het vitamine C-gehalte van rauwe en gepasteuriseerde melk', *NTvG* 70 (1926) 338, 347.

⁷⁴ Van Leersum, 'Pure melk', 3-4.

⁷⁵ Van Leersum, 'Over het vitamine C-gehalte', 348. Longer Dutch quote: “Ja, indien niet al reeds eenige onzer voornaamste graanvruchten opzettelijk van hun vitaminehoudende deelen werden beroofd; de boter niet uit de huizen der mingevoeden was verdreven geworden door de 'kunst'-boter die geen vitamines bevat; wanneer niet het gebruik van verduurzaamde voedingsmiddelen, welke vitaminegehalte allicht voor dat van versche onderdoet, meer en meer toenam; kortom, indien ieder in de gelegenheid of wijs genoeg ware om voor de noodige verscheidenheid in den kost te zorgen, dan zou men over het lot der vitamines in de melk niet het hoofd behoeven te breken. Maar zoo goed is de voedselvoorziening van een groot deel onzer bevolking niet, dat men zoo lichtvaardig zou mogen spreken. Er ontbreekt, vooral wat het jeugdig groeiende individu en de minvermogenen betreft, te veel aan de voeding, dan dat het geen zonde zou zijn een zoo voortreffelijk voedingsmiddel als melk van een belangrijk deel harer voedingswaarde te beroven.”

4. Ideal milk

Hygienists saw milk as a problematic foodstuff during the first decades of the twentieth century. The danger of easy disease infection could be solved by improving the production process and by pasteurisation. At the same time, the nutritious components of milk necessary for resistance of the human body against disease were feared to be destroyed by pasteurisation. This was especially a problem for children and other 'weak' members of society. Moreover, the effectiveness of pasteurisation was doubted by some. The solution was to produce model milk which did not contain harmful bacteria.

4.1 Farming physicians and veterinarians

The places to produce such model milk were 'model farms', which were founded after German examples from 1905 onwards. In 1877 the journal *Health (De Gezondheid)* praised a German 'model dairy farm' in Stuttgart. Already at this time, the qualification model referred to the hygienic circumstances at the farm, and the health of the cows. In 1905 the first Dutch model farm was founded, in Oosterbeek, after a German example that was awarded a price at the 'Hygienic Milk Exhibition' in Hamburg in 1903. In the following years, several other model farms were founded in the Netherlands. In the US and Britain, a similar rise in production of sound, raw milk occurred, here it was referred to as certified milk.¹

De Knecht-van Eekelen has argued that the popularity of model milk declined in the Netherlands after 1908, when a major advocate of pasteurisation, bacteriologist F. Basenau, had declared unheated milk dangerous, even when it came from model farms.² My findings however show, that model milk remained an appealing solution to milk-related problems for many hygienists. This is supported by the fact that a 'model milk decree' was debated in the 1920s, and introduced in 1940, staying in practice until 1950. De Knecht-van Eekelen notes this model milk decree, but sees it more as a relic of old views than as a sign of contemporary convictions on the need of model milk. In this chapter, I will show that the debate on the model milk decree in the 1920s was the result of recent debates in the 1910s and 1920s, concerning ideals about hygiene and health related to milk.

The word model was more widely used. The chairman of the subcommittee for the direct control of tuberculosis, M.W. Pijnappel, for instance used the phrase 'model school' when discussing the hygienic conditions at schools concerning tuberculosis control. Moreover, in women's magazines, 'model kitchens' were displayed and recommended by the Dutch Society for Housewives. 'Model factories' were founded as well.³

The attempts to put milk production under scientific supervision were started by paediatricians. The need of good quality cow milk became increasingly important in the rising attention for infant welfare. In France, Dr. Dufour advocated the founding of *gouttes de lait*, where infants who could not get breastfeeding were provided with "sound milk" in the 1890s.⁴ From 1905 onwards,

¹ De Knecht-van Eekelen, *Zuigelingenvoeding*, 198-204. For American certified milk, see: Susan D. Jones, *Valuing animals: veterinarians and their patients in modern America* (Baltimore & London: The John Hopkins University Press, 2003) 68-9.

² De Knecht-van Eekelen, *Zuigelingenvoeding*, 204.

³ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 22, 1918, 54; Anonymous, 'De modelkeuken der afd. 's Gravenhage der Vereeniging van Nederlandsche Huisvrouwen', *Zij: maandblad voor de vrouw* 12 (1928) 71-4; Schuurisma, *Jaren*, 275.

⁴ NA, 2.04.54 Ministerie van Binnenlandse Zaken: Volksgezondheid en Armenwezen 1892-1918 (Ministry of the Interior: Public Health and the Poor, later MI), inv. nr. 560 Stukken betreffende de oprichting van een 'Union International pour la protection de l'enfance du premier age' en betreffende de vertegenwoordiging van de regering op het tweede en derde internationale congres voor zuigelingenbescherming te Berlijn, 1907-1918 (Documents on

international conferences under the name of *Gouttes de Lait* were organised. Unsurprisingly, milk was an important topic. The second International Congress for instance, advocated breastfeeding and medical control of cow milk for infants.⁵ De Lange visited those conferences. In her report of the third conference held in Berlin, she praised its facilities for infant care. However, she concluded with some negative remarks on the hygiene of the cow stable they visited, as nothing was done against flies.⁶ Hygienic milk production needed careful medical attention.

Paediatrician B.P.B. Plantenga (1870-1955) was inspired by the French *gouttes de lait*, and opened a 'milk kitchen' along with the first Dutch infant welfare institute in 1901. The milk kitchen provided poor mothers who were not able to breast feed with good quality cow milk. Milk kitchens remained in practice until the 1930s, when free milk was no longer thought necessary “as bait for the a-social”, and the money was spent on “breastfeeding bonuses” to promote breastfeeding, which was of course even better.⁷

Concerns over the effects of heated milk on the health of infants resulted in the founding of the first model farms in the Netherlands. Indeed, a substantial number of model farms were initiated, owned and even lead by paediatricians like Moll van Charante, H.W. de Monchy, and E.G.A. ten Siethoff.⁸ The use of model milk was advocated by paediatricians as the best substitute for “the ideal food” for infants, mother milk, as can be seen by the address on model milk to the Dutch Society for the Protection of Babies by Moll van Charante. He referred to the agriculturalist J. Boersma and the director of a model stable A. Stehouwer who had given him advice on “technical details” of model farming.⁹

What should model farms and their milk look like according to their proponents? The requirements were related to the concerns on bacteria infection and disease resistance of both humans and animals as discussed in the preceding chapters. Moll van Charante, who founded and owned the model farm *De Vaan* near Rotterdam,¹⁰ argued that the possibility of hygienic supervision of stables was the most important reason for establishing model farms. Moll van Charante noted that local inspection services could only prevent the selling of “adulterated or much polluted milk”, but had no power to control every part of the milk production process. Model farms under medical and veterinary supervision could and should do this.¹¹

These model stables should meet several physical criteria. Very important was the location near a large city, as “the transport of raw milk should be as short as possible”. Also water works and electricity were available near the cities, necessary for hygienic precautions like washing hands and inspecting cows using electric light. The model farms needed a lot of outside space for the cows, and the stables should admit light and fresh air as well. Another important aspect was the separation of rooms for keeping, cleaning, and milking the cows. Similar rooms should be available in a “little milk house” in the pastures outside. In the stable, a special “manure gutter” was needed, in order to get rid of excrements by a dragging horse, which saved the farm labourers the task of carrying the excrements out of the stables with barrows, which would result in “pollution of the stable air”. Moreover, a separate room for storing the milk was needed, equipped with an “ice machine” to cool

international contacts regarding the protection of early childhood), H.W. Methorst, Verslag der vergadering van het “bureau permanent” (1910) 1.

⁵ NA, 2.04.54 MI, inv. nr. 560.

⁶ Cornelia de Lange, 'Derde Internationaal Congres voor Zuigelingenbescherming (Gouttes de Lait)', *NTvG* 55 (1911) 1103. She noted: “Ik zag zelfs een vlieg drijven in den gesloten drinkbak van koe Amanda (dat is te zeggen, toen die bak even werd open gedaan).”

⁷ B. de Pree-Geerlings, I.M.N. de Pree and A.M.W. Bulk-Bunschoten, '1901-2001: 100 jaar artsen op het consultatiebureau voor zuigelingen en peuters', *NTvG* 145 (2001) 2461.

⁸ De Knecht-van Eekelen, *Zuigelingenvoeding*, 199, 204.

⁹ Moll van Charante, 'De zorg', 787; De Knecht-van Eekelen, *Zuigelingenvoeding*, 197-204.

¹⁰ This model farm left archival documents (a rarity) which De Knecht-van Eekelen has studied: De Knecht-van Eekelen, *Zuigelingenvoeding*, 199-201.

¹¹ Moll van Charante, 'De zorg', 790, 797.

the milk. Also, the milk should be bottled in separate glass bottles, securely closed with dated “paraffin wax paper” and tin against “pollution”. Another separate room was needed for cleaning returned, dirty milk bottles, which should be done using washing soda and steam, and of course tap water. Spring water should not be used, unless “of unexceptionable quality” (from the dunes or the *Veluwe*). Just like milk, water should be kept separate from the farm environment. When cows were grazing outside, the canals should be fenced off to prevent the cows from drinking water from canals rather than tap water. Several stables were needed as well, in order to be able to isolate cows which were suspected to be ill, sick cows, and calving cows.¹²

Another important condition for a model farm was healthy personnel. People suffering from tuberculosis of the lungs, typhoid fever, scarlet fever or diphtheria should be denied access to the stables. Personnel should be inspected by a physician twice a year. The cows should be inspected thrice a year by a veterinarian, and their milk should be researched for the presence of infectious bacteria by injecting it thrice a year in guinea pigs. In order to prevent the cows from getting tuberculosis, Moll van Charante considered it best to breed cows on the model farm itself. Resistance against contagious disease – mainly tuberculosis – was a matter of heredity, after all. Moreover, every day (except on Sundays) samples of the milk per three cows should be sent to the State Serum Institute in Rotterdam, for chemical and bacteriological research. All these strict measures should make the production of extraordinary germ-free model milk possible.¹³

Physicians widely agreed with Moll van Charante's argument. In the State Committee on tuberculosis, model farms were discussed approvingly. The subcommittee for the indirect control of tuberculosis argued for support of model farms, especially to ensure a safe milk supply for infants. Especially Heyermans presented the combined use of pasteurised milk for adults and model milk “under strict and scientific supervision” for children as the solution for the problem of milk infected with tuberculosis bacteria. The call for model farms in the Committee was not restricted to proponents of the indirect control, however. Spronck, who was a strong proponent of bacteriological control of tuberculosis, also argued for the founding of more model farms. He thought this was necessary to get rid of the most aggressive TB bacteria, which would possibly survive pasteurisation. Safest would be the production of model milk combined with pasteurisation.¹⁴

Physician E.C. Van Leersum, concerned about the harmful effects of heating on the essential milk vitamins, advocated model farms during the 1920s. Although Van Leersum thought the environment of the milk production was swarming with harmful bacteria, he did think hygienic production of raw milk was possible. Van Leersum pointed at model farms, for instance in Assendelft and Overschie, which produced milk under such hygienic circumstances that it could be consumed raw “without health danger”.¹⁵

Among veterinarians, model farming was also popular. Kroon referred to the argument of Moll van Charante when he was discussing the hygiene of milk for the Dutch Society for the Protection of Infants, and praised the Dutch model farms. In the 1920s, veterinarian Van Oyen devoted experiments to the production of germ-free and raw milk. He investigated how such milk

¹² *Ibidem*, 790-793, 796.

¹³ *Ibidem*, 793-796.

¹⁴ Roëll a.o., *Verslag*, 60; NA, 2.27.14 SC, inv. nr. 39 Rapport van mw. van Dorp voor de Subcommissie voor de indirecte bestrijding betreffende de bescherming van het gezonde kind tegen tuberculose (Report by Ms. Van Dorp for the Subcommittee for the indirect control regarding the protection of the healthy child against tuberculosis), August, 1919, 2; NA, 2.27.14 SC, inv. nr. 17, Nota door L. Heyermans, Bestrijding der gevolgen van de dier-tuberculose voor den mensch (Memorandum by L. Heyermans, Control of the consequences of animal tuberculosis for humankind), 318; NA, 2.27.14 SC, inv. nr. 33, Minutes, November 21, 1919, 350.

¹⁵ NA, 2.15.33 Gezondheidsraad 1920-1956 (Health Advisory Council, later HAC), inv. nr. 436 Stukken betreffende het adviseren aan de minister inzake hygiënische melkwinning 1925-1929 (Papers regarding advice to the minister on hygienic milk production), Minutes, March 23, 1925, 6-7; Van Leersum, 'Pure melk', 4 (quote).

should best be produced in two commercial milk farms near Rotterdam.¹⁶

4.2 Ideals in practice

'Model milk', however, was not necessarily 'ideal' milk. Preventing *any* bacteria from growing in milk was almost impossible.¹⁷ Some proponents of model milk thought the risks of raw milk consumption were still too large, especially when vulnerable infants were concerned. Moll van Charante advised the use of model milk when breastfeeding was impossible, but the model milk should still be heated before use. The advantage of model milk was not so much its rawness, but that it did not need to be heated twice, once during pasteurisation and once in the kitchen before use.¹⁸

De Lange advised raw model milk only in extraordinary situations when infants could not bear boiled or pasteurised milk, although she agreed that raw milk would be the best artificial infant food if the absence of bacteria could be guaranteed. Still, the conditions she described for the production of cow milk for the feeding of normal infants did not differ from the requirements of model milk phrased elsewhere. The stables should be “spacious, airy, dry and clean”, dust should be avoided, the cow should be washed before milking, its tail bound, the milker should wear clean clothes and wash her hands and arms, the water used for washing should be “fresh and pure”, the animals and milkers should not suffer from contagious diseases etc. Infant milk should be as ideal as possible.¹⁹

Although De Jong thought the production of germ-free milk was possible – “the cattle should be free from tuberculosis, then the milk can even be sterile”²⁰ – he thought Heyermans' solution of founding and supporting model farms too simple. Model farms faced “extraordinary large difficulties” in producing “good and sound raw milk”. The risk of germ infection could not be removed without being in control over the milk production of the entire country. All “production places of milk” should therefore be subjected to strict scientific supervision via the *Warenwet*, De Jong argued.²¹

Moreover, the advocates of model milk were faced with the problem that model milk was too expensive. The price of model milk was around 20 cents per liter in the 1900s, which was twice as high as normal milk.²² As Kroon voiced the problem: “For those who can afford it, model milk is an excellent product, for the masses it is unattainable.”²³ The socialist Heyermans probably exaggerated when he argued in the State Committee on tuberculosis that one model farm monopolized the trade of model milk, and sold it for 96 cents per liter. In any case, he argued for national and local government support for the founding of new model farms to lower the price.²⁴

Because of its high price, model milk was a tiny portion of the total amount of milk sold. For instance in Amsterdam, the Society for Dairy Industry and Milk Hygiene noted that “milk and buttermilk for infants, raw milk, [and] model milk” were products “of secondary importance”.²⁵ The

¹⁶ Kroon, 'De hygiëne', 208-209; Van Oyen, 'De productie', 14-15; C.F. van Oyen, 'Ervaringen met de melkwinning volgens Dr. Stenhouse Williams bij toepassing in Nederland', *TvD* 52 (1925) 49-59.

¹⁷ Hence the permitted amount of bacteria in the *Codex Alimentarius* of 1907: milk with more than 1 million bacteria per mL was considered unfit for adult consumption, and 100 000 bacteria per mL for infants. De Knecht-Van Eekelen, *Zuigelingenvoeding*, 188.

¹⁸ Moll van Charante, 'De zorg', 801.

¹⁹ De Lange, *Het kind*, 140-143.

²⁰ NA, 2.27.14, inv. nr. 33, Minutes, January 10, 1919, 91. Dutch quote: “het vee moet vrij zijn van tb, dan kan de melk zelfs steriel zijn”.

²¹ *Ibidem*, November 21, 1919, 350.

²² De Knecht-van Eekelen, *Zuigelingenvoeding*, 199.

²³ Kroon, 'De hygiëne', 209. Dutch quote: “Voor wie het betalen kunnen, is de modelmelk een uitstekend product, voor de groote massa is zij onbereikbaar.”

²⁴ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 21, 1919, 348.

²⁵ G.J. Blink ed., *De melkvoorziening van Amsterdam: uiteenzettingen van de Vereeniging voor Zuivelindustrie en*

consumption of model milk was estimated at 3000 to 4000 liters per day,²⁶ while the total national milk consumption per day was around three million liters in 1928.²⁷

Moll van Charante's model farm provided lower class families with cheaper model milk thanks to a philanthropic 'milk fund' in Rotterdam. However, even richer people were unwilling to pay more for model milk, Moll van Charante noted, as everyone was used to low milk prices “[i]n our country abounding in milk, a country that counts 3 million cows compared to a population of more than 6 million people”.²⁸ Moll van Charante's own model farm worked at a loss.²⁹

Van Leersum and Van Oyen argued for a slightly different solution to the money problem. They thought the production of raw, hygienic milk should be possible under less costly conditions than those prescribed for model farms. Van Leersum thought model farms too “luxurious”. Therefore he was even reluctant to use the phrase 'model milk' to describe his ideal milk, it could better be called “pure, raw milk”. Van Leersum thought “a beautiful design of the stable, with gleaming tiles, shining brass etcetera” was neither necessary nor sufficient to produce such pure milk. Van Oyen explained that strict control of health risks “based on laboratory experiments” was generally received as being “unworkable” in “normal life”. For milk this meant that the product meeting the highest scientific expectations would be too expensive for almost everyone. Van Oyen argued that dangers surrounding the milk should not be overrated. They should be handled with the “most simple although sufficient means”, and the resulting safe product should be available for the entire population. Van Oyen even nuanced the dangers of bovine tuberculosis: “One should not underestimate nor over-estimate this danger!”³⁰

Van Oyen and Van Leersum were inspired by the work of a British physician on the production of cheap hygienic milk: Robert Stenhouse Williams (1871-1932), the director of the National Institute for Research in Dairying in Reading. According to Atkins, the research institute was “undoubtedly the intellectual focus of the clean milk movement between the wars and of dairy bacteriology generally” in Britain.³¹ The ideal of Williams was to produce 'clean milk', which did not need to be pasteurized, was cheap enough to become popular with consumers, and was produced by farmers who had sufficient knowledge on the dangers of bacterial contamination of milk. Williams argued for five basic principles of clean milk production:

1. the milk should be cooled within three hours after milking;
2. covered milk pails prevented dust and dung from contaminating the milk;
3. steaming and sterilising cans and dairy utensils would reduce the growth of bacteria in the milk;
4. grooming and washing cows reduced the risk of milk contamination;
5. milking should be done by well-educated and motivated personnel.³²

As many farmers lacked water works, the first principle of cooling was thought to be problematic

Melkhygiëne naar aanleiding van het rapport van de Commissie van onderzoek in zake het instellen van een Gemeentelijk Melkbedrijf te Amsterdam (Den Haag: Vereniging voor Zuivelindustrie en Melkhygiëne, undated [1923]) 63.

²⁶ NA, 2.15.33 HAC, inv. nr. 436, Letter commission *Warenwet* to Minister of Labour, May 29, 1928, 4. Prof. W.C. de Graaff mentioned a trade of modelmilk of 2000 to 3000 liters per day in 1926: NA, 2.15.33 HAC, inv. nr. 436, Minutes, November 19, 1926, 3.

²⁷ NA, 2.15.33 HAC, inv. nr. 436, Letter commission *Warenwet* to Minister of Labour, May 29, 1928, 4. In Amsterdam on its own the entire milk consumption was already 350.000 liters per day in 1923, according to the local government as quoted in: Blink ed., *De melkvoorziening*, 70.

²⁸ Moll van Charante, 'De zorg', 800. Dutch quote: “Men is bij ons, in het land overvloeiende van melk, het land dat bij een bevolking van ruim 6 miljoen menschen meer dan 3 miljoen koeien telt, zóó zeer gewend aan lage prijzen voor melk, dat ook de meer gegoeden [...] er tegen opzien om meer te betalen dan den laagsten prijs.”

²⁹ De Knecht-van Eekelen, *Zuigelingenvoeding*, 201.

³⁰ Van Leersum, 'Pure melk', 4, 6; Van Oyen, 'De productie', 5-6, Dutch quote: “Men mag dit gevaar niet onder- maar ook niet overschatten!”

³¹ Atkins, *Liquid materialities*, 243.

³² *Ibidem*, 241.

in practice, but Williams' researchers had shown that sterilizing milking equipment was financially feasible for farmers, and a good alternative. Atkins notes that Shinfield – where the old cattle sheds Williams used to demonstrate his principles were located – “gradually became a place of pilgrimage”, referring to the visits of many British ranging from milk dealers to public health officials.³³

My findings moreover show that Williams had an international influence as well, at least in the Netherlands. Both Van Leersum and Van Oyen visited Reading, and were personally informed on the principles of cheap hygienic milk production by Williams. Both became enthusiastic advocates of Williams' method in the Netherlands.³⁴ According to Van Leersum, Williams succeeded in producing cheap “pure milk” with extraordinary simple means like intensive cleaning of the milkers' hands, the cow and the milking equipment. He was “deeply impressed” by Williams' success of producing milk with few bacteria in “an old-fashioned cow stable”, “an old barn”. Van Oyen praised Williams' “practical mind” in a similar way. Measures to improve existing farms were simple and could be “followed everywhere”. Van Oyen researched the milk produced “in the old barn” at Williams' institute (probably Shinfield) on its bacteriological content, and presented his findings in the veterinary journal. The pure milk did very well on the number of bacteria found. Van Oyen argued this was especially due to the use of sterilised milking equipment, as he showed with bacteriological results of milk produced with sterilised equipment and milk produced using non-sterilised equipment. Combined with good bacteriological inspection for pathogenic germs, Van Oyen argued, such relatively simply produced milk could “compete with the best model milk.” Van Oyen addressed the problem of a lack of water works at farms by pointing out that for the sterilization of milking equipment no special requirements of the water were necessary, as it was always used at boiling temperatures. The milk would never be in contact with the water, as all the milking equipment was only used when dry.³⁵

In 1924, Van Oyen started experiments to manage two milk farms: a normal farm in Overschie, and a model farm in Hilligersberg (both near Rotterdam), following the example of Williams' method. The aim was to investigate the economic possibilities of simply and thus relatively cheaply produced hygienic raw milk. As the production at the farm in Overschie was too small to finance bacteriological and veterinary inspection, Van Oyen and his colleagues Slager and Donkersloot did the veterinary and bacteriological inspection work “disinterestedly”.³⁶ Again, Van Oyen researched the bacteria content of his own 'Puritas' milk, now compared to the number of bacteria in model milk. The latter turned out to contain more bacteria.³⁷ Van Oyen therefore thought the method of Williams would be successful in providing a large percentage of the Dutch population with “fresh, germ-free milk”. Indeed, according to Van Oyen himself, 'Puritas' milk was quite successful thanks to his own public support. Nevertheless, his comments on the price of 'pure milk' reveal that it was hardly cheaper than model milk.³⁸

Williams' principle of well-trained and reliable personnel posed a problem in the eyes of Van Leersum and Van Oyen. According to Van Leersum, the contaminated environment of farms could be dealt with as long as the people handling the animals and the milk had excellent knowledge of bacteriology, analogue to the necessity of medical training in “antiseptics and aseptics” for wound treatment during war. I will come back to this remarkable comparison between a battle field and the

³³ *Ibidem*, 238-44.

³⁴ Van Leersum, 'Pure melk'; Van Oyen, 'De productie'; C.F. van Oyen, 'De melkwinning en melkcontrole onder leiding van Dr. R. Stenhouse Williams, te Reading: verslag van een onderzoek ter plaatse', *TvD* 51 (1924) 297-306, 364-73.

³⁵ Van Leersum, 'Pure melk', 5; Van Oyen, 'De melkwinning', 299, 306, 366-70.

³⁶ Van Oyen, 'De productie', 22.

³⁷ Van Oyen, 'De productie', attachment.

³⁸ Van Oyen discussed his research and involvement at the farm in Overschie (Delftweg 64) in: Van Oyen, 'De productie', 3-29. Van Oyen did not mention the price of the produced milk, but noted its “higher production costs” (p. 24). Van Oyen presented his research at the model farm in Hilligersberg in the Dutch veterinary journal: Van Oyen, 'Ervaringen', 49-59. The milk produced here was as expensive as model milk: 26 cents per 800 centiliter (p. 58).

countryside in chapter 6. For now, it is enough to note his emphasis on the medical ability and reliability of the personnel at a milk farm. Van Oyen emphasized the need of inspection of hygienically produced milk in a similar way: “the appropriateness of this system stands or falls with the supervision.” In this sense, Van Leersum and Van Oyen differed little from the other proponents of model milk. Ideal milk was produced under strict scientific control.³⁹

The hygienists faced with the problems of unhygienic cheap milk and expensive model milk, argued these problems should be solved by improving the hygienic circumstances of *all* cattle farms.⁴⁰ The meaning of model farming changed accordingly, as it was thought essential that improving the hygienic standards of milk should be financially feasible for all farmers. In this sense, model farms turned quite literally into models for the milk production at all Dutch cattle farms, whereas in the beginning of the twentieth century they had been exceptional producers of a marginal, elite product. Nevertheless, one important aspect of model farming remained central: veterinary and medical supervision of the milk production was thought absolutely necessary.

4.3 Consumers and milk

According to many professional actors involved in the milk debate, consumers were ignorant of and not interested in the milk problem. In 1923, Minister of Labour Aalberse noted to the Queen that “Often the public would refuse to consume milk, if it knew how it is produced.”⁴¹ Hygienists complained that Dutch consumers were uncritical about the quality of the milk, or at least unwilling to pay more for a better quality product. They accused consumers of thus inhibiting attempts to improve milk hygiene. According to chemist J.D. Filippo consumers would only buy the cheapest milk without regard for its quality: “The public itself is indifferent, it looks only to the price, not to purity.”⁴² Filippo pointed at a recommendation of the The Hague department of the Society of Housewives for the use of milk of the competitor of a dairy operating with special care for milk hygiene, only because this milk was cheaper. Apparently, the call for more hygienic milk could not be heard from consumers themselves.⁴³

Among milk traders, complaints on the unwillingness of consumers to pay more for better milk could also be heard. The Society for Dairy Industry and Milk Hygiene noted that many milk traders were successful in selling bad quality milk, as consumers were unwilling to pay a higher price for better quality. A housewife would more often buy cheaper, raw milk infected with TB bacteria from a small milk trader, than pasteurised, good quality milk from a dairy. The society argued that she could not *see* the difference between infected milk and pure milk, she did not know about the possible presence of bovine TB bacteria in milk anyway, and was unaware of the danger these bacteria posed for her child.⁴⁴ This situation meant a too large percentage of the milk supply was left in the hands of incapable milk traders, while traders who wanted to improve milk hygiene had no opportunities to develop.⁴⁵

³⁹ Van Leersum, 'Pure melk', 5; Van Oyen, 'De melkwinning', 364, 372. Dutch quote: “de doelmatigheid van dit systeem staat of valt met de gehouden contrôle.”

⁴⁰ Moll van Charante, 'De zorg', 802; Kroon, 'De hygiëne', 209; De Jong, 'Beteekenis', 219-220; Van Oyen, 'De melkwinning', 298; Van Leersum, 'Pure melk', 4-5.

⁴¹ NA, 2.11.06 DA, inv. nr. 8, Letter Aalberse to the Queen, June 14, 1923. Dutch quote: “Dikwijls zou het publiek weigeren de melk te gebruiken, als het wist, hoe ze gewonnen was.”

⁴² NA, 2.15.33 HAC, inv. nr. 436, Minutes, March 21, 1925, 8. Dutch quote: “Het publiek zelf kan het niemandal schelen, dat ziet alleen naar de prijs, niet naar zuiverheid.”

⁴³ NA, 2.15.33 HAC, inv. nr. 436, Minutes, March 21, 1925, 2, 8, 10.

⁴⁴ Blink ed., *De melkvoorziening*, 30. Dutch quote: “Om de eenvoudige reden, dat zij de bacillen niet ziet en niet eens weet, dat er in melk bacillen voorkomen, dat runderen ook wel eens tuberculose hebben en dat haar kind door bovine tuberculose besmet kan worden.”

⁴⁵ *Ibidem*, 29-30.

Consumers were an important social world in the debate on the hygiene of milk, as has become clear by these complaints and the problem of expensive model milk. What did consumers think of the milk problem? Did they endorse the ideals of hygienic milk production and raw milk consumption of hygienists? This is also a chance to include more women in my story, as they were in charge of the household and the food.⁴⁶ A lack of historical sources makes such questions difficult to answer. Advertisements and articles in popular journals can give an impression of what kind of message regarding milk consumers related to. I have researched the popular magazine 'Life Illustrated' (*Het Leven Geïllustreerd*), and the elite women's magazine 'The Woman and her Home' (*De Vrouw en haar Huis*) for statements on milk.

The popular weekly *Life Illustrated* did not contain advertisements for milk during the 1920s. However, it did contain some indications regarding the general felt hygiene requirements of milk. Especially the introduction of aluminium caps for milk bottles is interesting in this regard. In an article called 'How one should close milk bottles' the journal noted that although the saying 'milk is good for everyone' was used in popular speech, this could only be held true when the milk would be "cared for with the greatest attentiveness at the farm and in the dairy." The aluminium caps were introduced as a hygienic measure to store milk, approved by "doctors" and "milk authorities". Advertisements for the cap (see illustration) appeared regularly in the following editions, so the article on the caps was likely one of the many examples of covert, sponsored advertising in the magazine. The advertisements were illustrated with a picture of a bacteriologist discovering irregularities on the variant of the aluminium cap: a swing-cap with a rubber ring. The picture was accompanied by the text: "The bacteriologist condemns the repeated use of a rubber ring for the closure of milk bottles, as it is a breeding ground for souring, putrefying and other harmful bacteria." The alternative aluminium cap was presented as the best alternative, noted to be used by "the best equipped dairies".⁴⁷ The emphasis on hygiene and bacteria in such advertising seems to point at a general receptivity of consumers regarding hygienic arguments. They can be found in other advertisements regarding housekeeping as well. Examples are the bacteria-removing capacities of a new vacuum cleaner ("not only a need because of purity, but also a duty for the health of your family"), and the hygienic needs of sterilizing preserving jars for vegetables and fruits at home expressed in an article on a new sterilisation machine.⁴⁸

Some photo-reportages in *Life Illustrated* also related to milk. A reportage on the animal protection society Sophia in Amsterdam referred to the washing and milking of cows at the cattle market as an example of their good work. Here, cleanliness was related to animal welfare rather than milk hygiene. In a reportage on milk delivery in Italy, the South-Italian practice of supplying consumers with milk directly from the cow was commented on as providing the "freshest" milk possible. The journal also paid regular attention to high-quality animal-breeding, for instance to the Frisian herd book inspection of cattle. In 1923, when dairy farmers from the neighbourhood of Amsterdam were protesting against low milk prices offered by milk dealers, the journal approvingly noted one of the consequences of the campaign: cheap milk sold by the farmers themselves for 11 cents per liter and "soon even cheaper".⁴⁹

⁴⁶ Van Otterloo, *Eten*, 11.

⁴⁷ Anonymous, 'Hoe men melkflesschen sluiten moet', *Het Leven Geïllustreerd* 20 (1925) 1086-7; Advertisement 'De bacterioloog veroordeelt', *Het Leven Geïllustreerd* 20 (1925) 1416.

⁴⁸ Advertisement 'Electrolux Reinigingsmethode: Desinfecteerenden Electrolux Filter', *Het Leven Geïllustreerd* 18 (1923) 622; Anonymous, 'Een omwenteling op het gebied van steriliseeren', *Het Leven Geïllustreerd* 19 (1924) 951-2.

⁴⁹ Anonymous, 'Practische dierenbescherming te Amsterdam', *Het Leven Geïllustreerd* 20 (1925) 658; Anonymous, 'Hoe de melk in Italië bij de klanten komt', *Het Leven Geïllustreerd* 20 (1925) 916; Anonymous, 'Friesche stamboekvee-keuring', *Het Leven Geïllustreerd* 14 (1919) 739; Anonymous, 'Een nieuwe melkoorlog in de hoofdstad', *Het Leven Geïllustreerd* 18 (1923) 564.

DE BACTERIOLOOG VEROORDEELT



het herhaald gebruik van een gummiring voor de afsluiting van melk, daar ze een kweekbodem is van zuurmakende, rottings- en andere schadelijke bacteriën.

Een betere sluiting is de
ALUMINIUM
„DAN“-CAPSULE



die slechts één maal wordt gebruikt en met de hand wordt afgescheurd, de flesch verzegelt, den geheelen kop omsluit en dien tegen stof, vliegen en onreine handen beschermt.

Modern ingerichte Melkinrichtingen gebruiken deze sluiting. Men vrage steeds deze hygiënische sluiting.

Fabrikanten zijn:

DE ALUMINIUM CAPSULEFABRIEK
„DAN“-FLESCHENSLUITING
LIJNBAANSGR. 392, AMSTERDAM. TEL. 44968.

Advertisement for closing milk bottles with aluminium caps. *Het Leven* Geïllustreerd 20 (1925) 1416.

In the elite journal for women *The Woman and her Home* milk hygiene was explicitly addressed in advertisements as well, although advertisements for normal, fresh milk did not occur. Nestlé advertised its milk products⁵⁰ in 1921 by noting it did not contain “germs”. In another advertisement, Nestlé recommended its condensed milk as having advantages over fresh milk. It was nutritious for children, and “bacteria-free, it saves them contagious diseases”. Moreover, the product was cheap, as it saved gas by not needing boiling, and in winter it could compete with the high prices of fresh milk. Here, the advertisement referred to boiling milk at home as a normal practice, connected to the need to kill harmful bacteria. Also, the price of milk was referred to as a

⁵⁰ De Knecht-van Eekelen has discussed the industrial processing of milk for the feeding of infants by companies like Nutricia and Nestlé during the second half of the 19th century, as a reaction to scientific research on the differences in composition between human milk and to animal milk, and growing fears for bacteria infection. See: De Knecht-van Eekelen, *Zuigelingenvoeding*, chapter 9, 245-96; De Knecht-van Eekelen and De La Bruhèze, 'De witte motor', 311-4.

central argument for women, even in this elite women's journal.⁵¹

The Woman and her Home also published an article on the food regulations of the *Warenwet* in May 1925, just before the milk decree was accepted. The author of the article Aafke O. Steenhuis (1894-1955) called the efforts of the government to regulate food inspection at state level “tender care”. Nevertheless, many housewives would not know about these regulations, as “What housewife would have time to go into the subject?” Although Steenhuis warned that not all foods had to meet legal regulations yet, in general the quality already had improved. Only the production of milk was an exception, as it often took place “in the most primitive and unhygienic circumstances.” Steenhuis quoted from the report of the local inspection service in Arnhem to illustrate this. As especially worrisome, she noted the presence of inflammatory bacteria of sick cows in 54 of 3152 milk samples, and the presence of more than the standard of 50.000 bacteria per cm³ in four samples of “raw milk, of which was suspected it was [...] sold as so-called model milk or infant milk”. Steenhuis did not mention tuberculosis or typhoid fever as particular dangers for milk infection. At the end of her article, Steenhuis emphasized the need for housewives to keep watch on the quality of foods themselves “despite a mass of inspection services”, as some adulterators would continue their practices in spite of the regulations.⁵²

Other sources that can reveal something on the practices of housewives regarding milk, are books and articles meant to compare the 'normal' Dutch household to the household in a foreign country. During the first decades of the twentieth century, an increasing number of Dutch women moved to the Dutch East Indies.⁵³ An example of an advice book on housekeeping in the Dutch East Indies from the 1920s, is a small book written for “the Dutch girl who goes to the Indies as a housewife”, written by C.J. Rutten-Pekelharing (1886-1920).⁵⁴ Rutten-Pekelharing was academically trained in biology,⁵⁵ but she wrote this book explicitly as a housewife with personal experience in the Dutch East Indies. Rutten-Pekelharing compared life in the Indies consequently to the 'normal' Dutch life her readers were used to. In a chapter called 'The Dutch cleanliness, practised in an Indonesian [*Indisch*] house', she noted that hygiene was first priority “in a country, where many serious contagious diseases are always threatening”. The diligent Dutch housewife could better leave spiders in place (those would eat mosquitos), but she should radically remove “germs” and “moulds” from her house. In a chapter on food, Rutten-Pekelharing discussed which foods were safe to eat and how they should be stored in the hot climate. Her tone regarding the native population was patronizing. The native servant should be taught “calmly and firmly” to store all foods in the meat safe (*vliegenkast*), and always to close its doors. Indonesians were notorious for the bacteria they carried causing diseases of the intestines. Therefore, it was only safe to eat boiled and cooked food prepared by an Indonesian, as “boiled filth is hygienically speaking not filthy anymore! That is a wonderful principle.”⁵⁶ Here, Rutten-Pekelharing showed great trust in the germ-killing capacities of heating. She warned against the tendency to look for Dutch food in the Dutch East Indies. Such food, she argued, would only be available in tin cans, and was “dead”, threatening its consumers with vitamin deficiency diseases like beri beri. The army was generally equipped with vegetable gardens and “living cattle” for this reason. Indonesian foods were much

⁵¹ Advertisement ‘Nestlé’s melk’, *De Vrouw en haar Huis* 16 (May 1921) 46; Advertisement ‘Nestlé’s gecondenseerde melk’, *De Vrouw en haar Huis* 16 (September 1921) 176.

⁵² Mr. Aafke O. Steenhuis, 'De Warenwet', *De Vrouw en haar Huis* 20 (May 1925) 31-6, especially 34-5 on milk. Steenhuis also discussed the Meat Inspection Act in a later article: Aafke O. Steenhuis, 'De Vleeschkeuringswet', *De Vrouw en haar Huis* 21 (September 1926) 206-10.

⁵³ Schuursma, *Jaren*, 438-9.

⁵⁴ C.J. Rutten-Pekelharing, *Waarom moet ik denken? Wat moet ik doen? Wenken aan het Hollandsche meisje dat als huisvrouw naar Indië gaat* (Gorinchem: J. Noorduijn & Zoon, 1923).

⁵⁵ Rutten-Pekelharing got her PhD in plant biology in 1909 at the University of Leiden, cum laude. She moved to the Dutch East Indies with her husband, the geologist M.R. Rutten (1884-1946). Anonymous, 'dr. C.J. Rutten-Pekelharing (1886-1920)', *Damescompartiment Online*. September 1, 2000. <http://www.damescompartiment.nl/biografie/rutten.html> (July 19, 2012).

⁵⁶ Dutch quote: “gekookt vuil is hygiënisch niet meer vuil! Dat is een heerlijke stelregel.”

cheaper and healthier: “with courage and conviction every healthy person can learn to eat them”.⁵⁷

Rutten-Pekelharing devoted a separate chapter to the feeding of children in the Dutch Indies, in which she discussed milk, showing the special meaning of milk as food for infants and children. The chapter shows that for Rutten-Pekelharing milk had the dual characteristics of delicateness for disease infection and 'living' nutritional value. Rutten-Pekelharing considered the use of raw and fresh milk, boiled at home to kill any harmful germs, the best solution to this problem. Just like other foods, fresh milk was always preferable to milk from tins, even when the milk was “blueish through shortage of fat and dilution”. The milk dealer in the Dutch East Indies could hardly be trusted. The milk should always be boiled well to prevent souring which would happen quickly in the hot climate, but it should not be boiled too often “to prevent unnecessary killing” of milk's 'living' components. When no fresh milk was available, canned milk was the only possibility. Although physicians preferred the liquid variety of canned milk, Rutten-Pekelharing advised the use of “half-condensed” milk, as it was uncertain whether liquid canned milk preserved any of its 'living' characteristics at all, half-condensed milk was cheaper, and could be better stored. Moreover, Rutten-Pekelharing gave elaborate advice how to clean feeding bottles and rubber teats in boiling water, again showing large trust in the effectiveness of heating in killing germs. Even if some milk rests might be left in the boiled bottles, any harmful organisms would be killed, she noted.⁵⁸

The Woman and her Home also published articles on life in the Dutch East Indies. In one of them milk was discussed. Milk was available almost everywhere, the author noted. In small places “some Mrs or another keeps cows and sells the milk with pleasure”. The large cities “even have the model stables”. Nevertheless normal and cheaper “*kampong* milk” (produced by native people) could also “very well be used”, as municipal inspection services took samples of such milk for inspection. “In the case of an emergency” preserved milk in tin cans could be used. Both canned milk and fresh milk were expensive: “50 cents per liter is no exception”.⁵⁹

Milk had a special meaning as ideal food for 'the weak' in society in the perception of consumers. Although special processed foods for “recovering people” were advertised in the popular journal *Life Illustrated*, women seem to have thought milk the most suitable food for their sick and weak family members. Rutten-Pekelharing for instance advised bed rest and a “milk diet” for patients in the Dutch East Indies.⁶⁰

These sources put together give an impression of the meaning of the hygienic milk problem for Dutch consumers. Dutch housewives indeed thought a low price of milk very important. This was however not a result of their 'ignorance' of or 'indifference' to the dangers of milk contamination and infection. A good Dutch housewife was successful in combining cheap housekeeping with hygienic housekeeping. Regarding milk hygiene, women generally put large trust in the germ-killing capacities of heating the milk at home, and do not seem to have shared the ideals of raw milk consumption as advocated by hygienists. In this, they differed remarkably from American and British consumer ideals of bacteria-free and raw milk as discussed by Peter Atkins and Susan Jones.⁶¹ Dutch consumers nevertheless shared some belief in the 'liveliness' of milk, as they thought too much heating would have negative effects, and conserved milk was generally thought to be less beneficial than fresh milk.

⁵⁷ Rutten-Pekelharing, *Waarom moet ik denken?*, chapters 13 and 14, 48-59.

⁵⁸ *Ibidem*, chapter 15, 59-64.

⁵⁹ H.H. van Hoorn-van Balen, 'Kijkjes in de Indische huishouding', *De Vrouw en haar Huis* 21 (October 1926) 235-9, especially 237-8 on milk.

⁶⁰ Advertisement 'Herstellenden drinkt: Malto', *Het Leven Geïllustreerd* 14 (1919) 728; Advertisement “‘Ready’: het beste voedingsmiddel voor kinderen en herstellenden”, *Het Leven Geïllustreerd* 16 (1921) 737; Rutten-Pekelharing, *Waarom moet ik denken?*, 64; Aafke O. Steenhuis, 'De Warenwet', *De Vrouw en haar Huis* 20 (1925) 35; R. Doodewaard-Godschalk, 'Mijn zorgenkind', *Zij: maandblad voor de vrouw* 12 (1928) 6.

⁶¹ Jones, 'Mapping', 143-5; Atkins, 'The pasteurisation', 42-8.

4.4 The model milk decree

As model milk was thought to be such a delicate and complicated product, the need for regulations on the production of safe raw milk were voiced regularly by physicians and veterinarians.⁶² In 1919, the *Warenwet* had been accepted by the Dutch parliament. A milk decree with all the specific requirements regarding the quality of milk was prepared by a commission at the Ministry of Labour. The commission finished its first concept-milk decree in January 1921. Although the *Warenwet* and the milk decree were considered of grave importance, it would take until 1925 before the milk decree was finally accepted. This long process will be discussed in more detail in chapter 5, as it was largely due to discussions between public health officials and producers of milk. For now, it is interesting to note that in the first concept-milk decree, 'model milk' was addressed in one of the articles, while this article had disappeared from the final milk decree of 1925. Here, the use of raw milk was addressed in the article on child milk. This article stated that further legislation was necessary for the use of raw milk, while normally child milk should be pasteurised or sterilized. The use of the phrase 'model milk' was deemed too risky to use with government approval without extensive regulations.⁶³

Further trials of legislation on model milk were carried out by the commission for hygienic milk production of the Health Advisory Board (*Gezondheidsraad*), as the medical profession was far from satisfied with the regulations on hygiene in the final milk decree of 1925, an issue that will also be addressed in more detail in the next chapter. Van Leersum was invited to elucidate his worries on the negative effects of pasteurisation of milk.⁶⁴ The commission for milk hygiene decided to devote a subcommission to the issue of model milk, in order to prepare a model milk decree. Van Leersum became a member of this model milk commission, together with Van Oyen, and J.B.M. Coebergh, the head pharmaceutical inspector of public health who was also responsible for the inspection of food stuffs.⁶⁵ Their concept model milk decree was finished in 1927.⁶⁶

Van Leersum, Van Oyen and Coebergh argued for the introduction of regulations for the production of 'raw pure milk'. This was deliberately not called 'model milk', as Van Leersum and Van Oyen thought the production of cheaper raw milk should be possible without the excessive 'luxury' of model farms. Nevertheless this milk should carry the characteristics of the absence of harmful bacteria and the nutritious value of rawness. The distinction between 'pure milk' and 'model milk' was not received with enthusiasm by the commission for hygienic milk production. Many members feared lack of clarity, and negative effects on the trade of model farms. Filippo for instance did not like the idea of "half and quarter model milk". According to W.C. de Graaff, professor in pharmaceutics in Utrecht, model farms faced enough difficulties already, without even stricter requirements to compete with the 'pure' milk advocated by Van Leersum, Van Oyen and Coebergh.⁶⁷

Indeed, the concept decree for 'raw pure milk' contained most of the strict requirements that were also expected from model farms as discussed earlier, like regular cleaning of the stables and cows, fresh air and light, regular bacteriological control of the milk, veterinary inspection of the animals and medical inspection of the personnel. The control of the quality was given to the

⁶² Kroon, 'De hygiëne', 208-209; NA, 2.15.37 DPH, inv. nr. 329, Letter Health Council of The Hague to the local government, October 26, 1921; Van Leersum, 'Pure melk', 8; Van Oyen, 'De productie', 23; Chief inspector of public health (contagious diseases), 'Bestrijding', 351-352; M.D. Horst a.o., 'Melkbesluit', 495.

⁶³ NA, 2.15.37 DPH, inv. nr. 329, Letter *Warenwet* commission to Minister of Labour, May 29, 192[3]; NA, 2.11.06 DA, inv. nr. 8, Concept milk decree [c. 1922], article 4; Concept milk decree, June 14, 1923, article 11; *Staatsblad van het Koninkrijk der Nederlanden* 256 (June 1925), article 11.

⁶⁴ NA, 2.15.33 HAC, inv. nr. 436, Letter Van Leersum to J. Jitta, January 29, 1925; Letter Jitta to P.A. van Meerburg, February 4, 1925; Minutes, March 21, 1925, 1-14.

⁶⁵ *Ibidem*, Letter Van Leersum to Jitta, June 29, 1925.

⁶⁶ *Ibidem*, Concept model milk decree, February 3, 1927.

⁶⁷ *Ibidem*, Ontwerp Algemene maatregel van bestuur betreffende bijzondere aanduidingen voor melk, onder toezicht bereid (Concept General government measure concerning special indications for milk produced under supervision), July 1926; Minutes, November 19, 1926, 3-4.

Minister of Labour personally.⁶⁸ Eventually, the commission decided to use the phrases 'raw, pure milk', 'model milk' and 'health milk' as synonyms in the model milk decree. Filippo emphasized the goal of the whole enterprise: “We want to have an ideal milk. The name is of no importance. Besides the usual commercial milk one wishes for an ideal milk here.”⁶⁹ The concept model milk decree was published in the journal of the Health Advisory Council in 1927, in an edition only meant for the members of the Health Advisory Council and inspectors of public health. The commentary emphasized the importance and possibility of cheaper produced safe raw milk, meeting some of the objections of Van Oyen and Van Leersum concerning 'luxurious' model milk.⁷⁰

Despite all these efforts, the commission responsible for the elaboration of the *Warenwet* in specific decrees on food stuffs, did not accept the model milk decree as proposed by the Health Advisory Council. It had four reasons:

1. the inspection services were not equipped to inspect the model milk according to the directions, as they did not employ veterinarians;
2. the amount of model milk traded was too small, therefore it should be considered a medicine rather than a food stuff;
3. the medical profession had little interest in expensive model milk;
4. the government could never guarantee that raw milk was safe and bacteria-free, the risk of milk infection at “fake model farms” was too high.⁷¹

Nevertheless, the *Warenwet* commission agreed that legislation should be made for milk meeting “the practically attainable highest demands”.⁷²

The commission for hygienic milk production of the Health Advisory Council reacted critical to this conclusion. Members opposed the reasoning that physicians were not interested in model milk. Although the actual trade in model milk was not impressive, they argued that the use of raw, safe milk was (or should be) a medical ideal. The price of the product was no reason to think inspection unnecessary. The chairman of the Health Advisory Council, Josephus Jitta, argued the use of “sound raw milk” had “hygienic advantage”, and the public would become interested in the product once it understood this value. Van Leersum pointed out that research on the benefits of raw milk was still quite young. Also, he argued that the price could never be an argument to deny lower classes healthy raw milk when research had shown they needed it.⁷³

However, a majority of the commission for hygienic milk production agreed with the criticism that the government could never guarantee safe raw milk. One of the members summarized the doubts by arguing that it was impossible to make absolutely sure that milk was not infected with harmful bacteria: “For these reasons the Government can not guarantee raw consumption.”⁷⁴ The many germs threatening to contaminate the milk, among them still unknown diseases like the recently discovered bacterium of Bang, could not be banned entirely. Van Leersum, Van Oyen and Coebergh were the only members who thought the benefits of raw milk consumption were more important than the risks of infection, which were slight in their eyes if the strict directions were followed. The ideal of raw and safe milk remained an ideal, the reality of germs was considered too unmanageable.

As the need for a model milk decree remained necessary to prevent abuse of the word model farm, the Health Advisory Council pressed the milk commission of the Commodities Act to come

⁶⁸ NA, 2.15.33 HAC, inv. nr. 436, Concept General government measure, July 1926.

⁶⁹ *Ibidem*, Minutes, November 19, 1926, 5, 7. Dutch quote: “Wij willen een ideaalmelk hebben. De naam kan ons immers niet schelen. Naast de gewone handelsmelk wenscht men hier een ideaal melk.”

⁷⁰ *Ibidem*, *Gezondheidsraad – Mededeelingen* N° 1 (1927) 64-77.

⁷¹ *Ibidem*, Minutes, December 13, 1928, 1; NA, 2.15.37 DPH, inv. nr. 366, Letter *Warenwet* commission to the Minister of Labour, May 29, 1928.

⁷² NA, 2.15.37 DPH, inv. nr. 366, Letter *Warenwet* commission to the Minister of Labour, May 29, 1928.

⁷³ NA, 2.15.33 HAC, inv. nr. 436, Minutes, December 13, 1928, 2-3.

⁷⁴ *Ibidem*, 8. Dutch quote: “Om deze redenen laat men geen garantie voor rauw gebruik op de Regeering rusten.”

up with a new model milk decree.⁷⁵ A model milk decree was finally introduced during the German occupation of the Netherlands in 1940. This is interesting material for further study as it possibly relates to Nazi-ideals of purity, naturalness and motherhood. In 1949, a less war-tainted model milk decree was accepted, in which all authority to call a farm a model farm was given to the Minister of Social Affairs.⁷⁶

In 1950, physicians in *NTvG* discredited model farms because of outbreaks of contagious diseases through raw milk consumption.⁷⁷ Model milk produced by more than thirty Dutch model farms unjustifiably carried “the aureole of being 'extra healthy'”. The ideals of raw milk among physicians and veterinarians in the preceding decades were forgotten: “the Model milk decree designed and maintained against hygienic advice, should be withdrawn.”⁷⁸ This was done in 1950.⁷⁹ Bacteria had beaten the nutritional value of the 'living' liquid.

⁷⁵ NA, 2.15.33 HAC, inv. nr. 436, Letter Meerburg to Minister of Labour, January 7, 1929.

⁷⁶ NA, 2.15.37 DPH, inv. nrs. 366 & 531 Modelmelkbesluit 1926-1950 (Model milk decree).

⁷⁷ J.J. van Loghem, 'Het einde van de modelmelk?', *NTvG* 94 (1950) 183-184; H.C. Hallo, 'Besmetting met tuberkelbacillen door modelmelk', *NTvG* 94 (1950) 1081-4.

⁷⁸ Hallo, 'Besmetting', 1084. Dutch quote: “Tevens is het [...] duidelijk, dat het tegen hygiënisch advies tot stand gekomen en tegen hygiënisch advies gehandhaafde Modelmelkbesluit behoort te worden ingetrokken.”

⁷⁹ De Knecht-van Eekelen, *Zuigelingenvoeding*, 204.

5. Milk as battle ground of experts

The debate on milk centred not just on non-human subjects like bacteria, nutrients, animals and farms. Interests of people were important for the duration of the debate as well. Several stakeholders tried to 'conquer' the problem of easily infected milk. Physicians, veterinarians, chemists, cattle farmers, and milk traders, all had their own reasons for claiming authority. This battle ground of experts will be the central topic of this chapter.

5.1 Bacteria or society, animals or people?

I have argued in chapter 3 that members of the State Committee for the control of tuberculosis were generally in favour of a combination of direct and indirect control of tuberculosis. Nevertheless, differences in emphasis existed between proponents of the two directions, especially when practical measures were concerned. Therefore, my disagreement with Abbo-Tilstra on the combination of or opposition between the direct and indirect direction in Dutch tuberculosis control is more one of nuances than of big differences.¹

The strongest positions in the direct-indirect debate were taken by the socialist physician Heyermans and expert on animal tuberculosis De Jong, in their debate on the importance of animal tuberculosis. The control of animal tuberculosis as advocated by De Jong was a symbol of 'rational' bacteriology, as it was based on the idea that every source of TB bacteria should be eliminated or at least controlled. On the other hand, social reformer Heyermans abhorred the idea that tuberculous animals or their bacteria would get more attention than tuberculous, poor people. This debate reveals pressing social concerns and political discussion at a time of a growing influence of socialism in the Netherlands, issues that were influencing the medical profession as much as society at large. Animals, or more particularly cows as the main producers of milk, were not simply representing their own animal/agricultural world in this discussion: they were symbols for ideas on the organisation of society, and they evoked deep emotions on moral and social behaviour. Milk had a particularly interesting position in these debates, because of its two clashing characteristics: special vulnerability for TB infection, and special nutritional value for 'the weak' in society.

The differences in opinion on the importance of animal tuberculosis should also be seen in the broader context of the 'elevation' of veterinary medicine, as historian Offringa has called and analysed the process.² In the Netherlands, only one veterinary school existed, in Utrecht. In 1918, this State Veterinary School (*Rijksveeartsenijsschool*) was changed into the higher level 'Veterinary Highschool' (*Veeartsenijkundige Hoogeschool*). Only in 1925, veterinary medicine became a university faculty, at equal level with medicine. Moreover, in 1917, and again in 1925, veterinarians tried to change their official name from 'cattle' doctors (*veeartsen*) into 'animal' doctors (*dierenartsen*) via Dutch Parliament. They argued they did not only treat cattle, but other animals as well. Veterinary medicine wanted to get rid of the stigmatizing connotation with 'unscientific' farming. This wish was not fulfilled however, as the majority of Parliament thought 'cattle' doctors was adequate enough.³ De Jong was an exceptional veterinarian in the Netherlands, as he was appointed professor at the medical faculty in Leiden. Nevertheless, he had to cope with convictions on the difference in status between veterinary medicine and medicine.

Animal tuberculosis was a recurring theme in almost every meeting of the subcommittee for the

¹ See chapter 3, p. 23, for my criticism of Abbo-Tilstra's argument.

² Offringa, *Van Gildestein*, 231-344. Offringa uses the Dutch word *verheffing*.

³ Offringa, *Van Gildestein*, 250, 331-2. In 1923, a humorous reference to this debate was made in the illustrated weekly *Life Illustrated*. Under the picture of a tame elephant was written that a "Cattle doctor [*veearts*], - animal doctor [*dierendokter*] we call him these days" provided the elephant with Dutch gin in dried America. *Het Leven Geïllustreerd* (1923) 48.

direct control of tuberculosis.⁴ During one of the first meetings, De Jong explained his ideas on the widespread occurrence of TB bacteria among humans, mammals, and birds.⁵ Only during the last meeting the subject was finally settled.⁶ The main reason for this ongoing discussion, was the clash between Heyermans and De Jong. This clash was representative for the strongest disagreements between proponents of the direct and indirect control of disease, and for the clash in authority between physicians and veterinarians.

As De Jong argued during one meeting, his difference of opinion with Heyermans had a clear “political side”.⁷ Heyermans was a socialist, De Jong clearly was not, as he did not have “as much trust in the people [...] to believe it will be educated in 50 years.”⁸ To force “the unwilling”, De Jong argued for binding legislation concerning the spread of TB bacteria among humans, like compulsory disinfection of sputum. Heyermans and his supporter E.J. Abrahams (physician and a member of the *Vrijzinnig-Democratische Bond* or the Liberal Democratic Confederation) opposed these kind of measures, as they wanted to focus on the social circumstances to strengthen the resistance of people, mainly poor labourers.

Heyermans made it very clear that he did not think the subject of animal tuberculosis of importance, while at the same time he used every opportunity to contradict De Jong. Related to his socialist political views, Heyermans had two major reasons for vehemently opposing De Jong's ideas on the dangers of animal tuberculosis for human beings: he did not think bacteria were of great importance for developing tuberculosis, and he looked down upon veterinary medicine.

Firstly, Heyermans thought the chance of getting tuberculosis was maybe diminished by measures against bacteria, but only improvement of social circumstances would truly prevent people from developing tuberculosis. By stating this, Heyermans opposed the central assumption of the direct control of tuberculosis, namely that battling TB bacteria would make a big difference in the incidence of the disease. Heyermans saw De Jong as the ultimate proponent of this direction, and argued his disagreements with De Jong were not about “a tiny difference of opinion”, but about “fundamental principles concerning the essence of the manner of control and the method used.”⁹ De Jong's warnings that TB bacteria were widely spread by both humans and animals were only proof that TB bacteria did not necessarily cause disease.¹⁰

Secondly, Heyermans was indifferent to the animals who could spread TB bacteria according to De Jong. Measures against coughing cows and birds were ridiculous while such high numbers of poor people were suffering from tuberculosis.¹¹ Telling is the proposal Heyermans wrote for the final conclusion on the importance of animal tuberculosis, in February 1919. The “battle against the animal-form of tubercle bacilli” should be “a very simple one”, focussing on food quality, as only in this sense animal TB bacteria related to human interests.¹² Heyermans used authority arguments on the priority of human medicine over veterinary medicine to support this. In one of his proposals for a final conclusion on animal tuberculosis, Heyermans argued that the State Committee should not discuss animal tuberculosis, as it had no expertise on it. Implicitly,

⁴ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 22, 1918, 41; January 10, 1919, 90-92; February 1, 1919, 96-110; February 21, 1919, 111-2; April 4, 1919, 163-6; April 12, 1919, 179; November 7, 1919, 336-344; November 21, 1919, 346-53; December 12, 1919, 369-70; March 19, 1920, 497-8.

⁵ *Ibidem*, November 8, 1918, 26-34.

⁶ *Ibidem*, April 16, 1920, 525.

⁷ *Ibidem*, April 16, 1920, 517.

⁸ *Ibidem*, July 11, 1919, 285. Dutch quote: “zooveel vertrouwen in het volk [...] om te gelooven dat het over 50 jaar opgevoed zal zijn.”

⁹ NA, 2.27.14 SC, inv. nr. 17, Nota van den Heer Heyermans inzake de hygiënische opvoeding (Memorandum by Heyermans on hygienic education), July 1919, 268. Original quotes: “een gering meningsverschil” and “grondbeginselen die de kern van de bestrijdingswijze en de toe te passen methoden raken.”

¹⁰ NA, 2.27.14 SC, inv. nr. 33, Minutes, September 14, 1918, 6; January 10, 1919, 91; May 9, 1919, 205-6; NA, 2.27.14 SC, inv. nr. 17, Memorandum by Heyermans on hygienic education, July 1919, 266-9.

¹¹ *Ibidem*, April 4, 1919, 164-5.

¹² *Ibidem*, Heyermans' proposal for the conclusion on the importance of animal tuberculosis, February 1919, 109.

Heyermans isolated veterinarian De Jong from the other members, who were “physicians, lawyers and members with expertise on the economic and social relations concerning tuberculosis control.”¹³ The advice of De Jong to make the reporting of tuberculous animals compulsory should not be followed, as he was the only member of the subcommittee with authority to speak on the subject, be it a “pre-eminently expert member”. It would be better, Heyermans argued, to install a separate state committee on the control of animal tuberculosis.¹⁴

Heyermans was right in the sense that De Jong was invited to join the State Committee relatively late, as the only veterinarian.¹⁵ However, De Jong had been a member of the medical debate on tuberculosis control in earlier years,¹⁶ and felt insulted by Heyermans' remarks. He agreed that the main focus should be on the control of tuberculosis of humans, and he emphasized attention for animal tuberculosis was necessary to do this properly. De Jong's argument that both human and animal TB bacteria should be controlled had been based on their relevance for public health. To banish him to a separate state committee on animal tuberculosis was beside the point. The State Committee had a responsibility to evaluate acts related to public health and the control of tuberculosis, like the *Warenwet* and the Meat Inspection Act: “we should certainly investigate if something should be changed to make those as good as possible for the tuberculosis control.”¹⁷ De Jong accused Heyermans of inconsistency and ignorance on the matter, as his alternative solutions to animal tuberculosis were no less complicated. If he was to be called “one pre-eminently expert member” on animal tuberculosis, others should be so as well for their topics. Moreover, De Jong presented himself as an equal member of the medical profession, also authorized to talk on matters related to human health.¹⁸

Heyermans did not just oppose De Jong. He attacked other members of the subcommittee for the direct control of tuberculosis as well, although the discussions with De Jong were most numerous. For instance, physician M.W. Pijnappel (often a defender of De Jong) resigned as a chairman after severe criticism of Heyermans and like-minded Abrahams.¹⁹ In one of the last meetings, Heyermans demanded a choice between the direct and the indirect control of tuberculosis, although all members had stated they thought both directions of importance. This demand sharpened the differences between the two parties, which many members regretted. Heyermans explained his behaviour by referring to his worries that the social measures against tuberculosis would be ignored by the confessional government.²⁰

Eventually, a compromise was found for the stark differences of opinion between Heyermans and De Jong. The subcommittee concluded animal tuberculosis was “of major importance” and should be considered dangerous for human health. Although the majority of the subcommittee thought TB bacteria spread by birds were “hardly of importance”, TB bacteria from

¹³ NA, 2.27.14 SC, inv. nr. 17, Memorandum by L. Heyermans, October 1919, 317. Dutch quote: “geneeskundigen, juristen en leden op de hoogte van de economische en sociale verhoudingen, die met de tuberculose-bestrijding samenhangen.”

¹⁴ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 7, 1919, 336-41.

¹⁵ De Jong was not present at the early preparatory meetings in 1918, which were held at Heyermans' house. Only in July 1918, De Jong appeared on the list of official members. He joined the meetings of the Committee on July 23, 1918 for the first time. NA, 2.27.14 SC, inv. nr. 1 Stukken betreffende het in- en samenstellen en ontbinden van de Staatscommissie inzake de bestrijding der tuberculose (KB 25 d.d. 3 juli 1918) 1917-1923 (Documents regarding the appointment and dissolving of the State Committee for the control of tuberculosis), Minutes, April 26, 1918; June 7, 1918; NA, 2.27.14 SC, inv. nr. 7, Minutes, July 23, 1918.

¹⁶ Dekker, 'Vergadering', 14.

¹⁷ NA, 2.27.14 SC, inv. nr. 33, Minutes, November 7, 1919, 336-7. Dutch quote: “wij moeten zeer zeker nagaan of daarin iets veranderd moet worden om die voor de tbc. bestrijding zoo goed mogelijk te maken.”

¹⁸ NA, 2.27.14 SC, inv. nr. 33, Minutes, Voorstel van den Heer D.A. de Jong (Proposal by D.A. de Jong [for a conclusion on the importance of animal tuberculosis]), February 1919, 105-8; April 4, 1919, 164; November 7, 1919, 336-7. For clear instances where De Jong identified himself as an equal member of the medical profession, see: NA, SC, inv. nr. 33, Minutes, November 7, 1919, 336-42; March 14, 1919, 147-8.

¹⁹ *Ibidem*, October 10, 1919, 249.

²⁰ *Ibidem*, March 19, 1920, 503-10.

cows should be regarded dangerous. Moreover, the report of De Jong was quoted extensively as the expert opinion on the topic, despite his unpopular view on the danger of birds. As the issue of milk pasteurisation was regarded, the majority of the subcommittee was convinced by De Jong's warnings that pasteurisation did not guarantee the death of all TB bacteria in the milk. Therefore, the use of TB bacteria-free milk was advised. In this sense, De Jong had won much.²¹

However, when measures against tuberculous animals were concerned, De Jong was less successful. Heyermans' critique was discussed elaborately in the final report of the subcommittee. Compulsory reporting of tuberculous cattle, a necessity according to De Jong and an abhorrence to Heyermans, was considered to be beyond the expertise of the State Committee. The subcommittee argued for “such government supervision [...], that [animals spreading TB bacteria] will not be dangerous anymore.”²² Heyermans could agree with this careful formulation.²³

Heyermans' problems with De Jong's emphasis on the dangers of animal tuberculosis were shared by other physicians. Many stressed the control of human tuberculosis should have priority over control of animal tuberculosis, and thought De Jong's concerns on the dangers of animal tuberculosis for human health were exaggerated. In the journal *Tuberculosis*, for instance, the head of the municipal medical service (*Gemeentelijke Geneeskundige Dienst*) of Amsterdam J.L.C. Wortman pointed out the unfair ratio of money spent on human tuberculosis control (f 160.000,- per year) and bovine tuberculosis control (f 400.000 per year): “It is a wrong principle, to rank the economy of cattle higher than the economy of mankind.”²⁴ Indeed, one of the reasons to abandon the bovine tuberculosis-eradication system 'Poels-Lovink' that was practised from 1904 to 1911, was the difference in money spent on animals and people.²⁵ Moreover, Wortman wrote on the different tasks of physicians and veterinarians when he was discussing the necessity of isolating coughing human patients with tuberculosis in a quality newspaper: “Veterinarians can more easily solve the problem which occurs in the same way with bovine tuberculosis. They slaughter the sick cattle.” Physicians however should look for “more humane measures”.²⁶ The underlying message regarding veterinarians was clear: the veterinary job of eradicating bovine tuberculosis was much simpler and more brutal. This fitted into the general image of veterinarians as lower status cattle doctors.

The reservations of paediatrician Scheltema regarding the importance of bovine tuberculosis should also be seen in the light of the unequal relation between veterinary and human medicine. He was fighting for the acknowledgement of tuberculosis as a child disease within the medical profession, and did not think animals – as belonging outside the realm of human medicine – equally important. He discussed animal tuberculosis only as an exception.²⁷

In 1927, Van Leersum, the champion of cheap 'pure' milk, complained to the Health Advisory Council he was “the only representative of medicine and dietetics” invited to a meeting of the *Warenwet* commission on the issue of model milk, while many other members were representing “the milk trade”. He thought this was “no good proportion of parties”. In the same letter, Van Leersum mentioned the other members who were invited, among them veterinarians Kroon and Van Oyen. Although he did not accuse them of bonds with the dairy trade as such, he definitely did not consider them as equals in the battle for public health issues either.²⁸

²¹ NA, 2.27.14 SC, inv. nr. 35, Rapport van het verhandelde in de Subcommissie voor de directe bestrijding (Report of the discussed in the Sub-committee for the direct control of tuberculosis), 535-7, 581, 583.

²² *Ibidem*, 581. Dutch quote: “zoodanige overheidstoezicht [...], dat [de smetstof verspreidende dieren] geen gevaar meer opleveren.”

²³ *Ibidem*, 579-83; NA, 2.27.14 SC, inv. nr. 33, Minutes, November 7, 1919, 341; November 21, 1919, 347.

²⁴ Dekker, 'Vergadering', 22. Dutch quote: “Dat is toch een abusief beginsel, om de economie van het vee hooger te stellen dan de economie van den mensch.”

²⁵ Abbo-Tilstra, *Om de sūnens*, 203-4.

²⁶ J.L.C. Wortman, 'Tuberculose-bestrijding in Nederland', *Algemeen Handelsblad* (January 17, 1918, morning), 6.

²⁷ Roëll a.o., *Verslag*, 158, 162 (foot note 1).

²⁸ NA, 2.15.33 HAC, inv. nr. 436, Letter Van Leersum to Jitta, November 8, 1927.

Despite efforts by veterinarians like De Jong to picture the eradication of food-borne zoonoses as a public health problem concerning both veterinarians and physicians, the practical control of animal and human disease remained separate issues in most medical eyes.

5.2. Chemical or medical authority?

Another social problem was the division of tasks among chemists on the one hand, and medical specialists (both physicians and veterinarians) on the other. During the nineteenth century, veterinarians and chemists had both strived for authority in food safety measures. Chemists were trained in the recognition of chemical adulteration of food products, an important nineteenth century problem. Veterinarians were trained in the recognition of disease in animals or their food products, a problem gaining attention from the late nineteenth century onwards. Koolmees has shown that veterinarians were very successful in acquiring meat inspection tasks at a local level during the nineteenth and the first two decades of the twentieth century, and at a national level after the passing of the Meat Inspection Act in 1919.²⁹ On the milk decree, veterinarians were less successful, although veterinary professors like Van Oyen and Kroon tried hard to provide veterinarians with new job opportunities in milk, cow and stable inspection.

No veterinarian became a permanent member of the commission on milk of the *Warenwet*. The chairman of the commission was chemist N. Schoorl (1872-1942), professor in toxicology and microchemistry in Utrecht, its vice-chairman was pharmacist W.C. de Graaff (1877-1944), professor in Utrecht,³⁰ and the secretary was chemist J.D. Filippo, head of the local food inspection service in The Hague. The other academically trained members had a chemical or pharmaceutical background as well, except for physician C. Eykman.³¹ As extraordinary members, the commission appointed veterinarians who were specialists on milk hygiene: Kroon and later also Van Oyen. A representative of cattle farmers, and two representatives of milk dealers were appointed as extraordinary members as well. This division of members shows veterinarians were clearly seen as experts connected to agricultural interests, while chemists were seen as objective government officials.³²

Complaints that veterinarians had close connections with the producers of animal products were not entirely unjustified. Van Oyen cooperated with dairy producers, and showed confidence in the abilities of farmers to improve the quality of their milk with simple means. He became for instance the chairman of a commission for milk hygiene installed by the dairy industry in 1923. As I have shown already in the previous chapter, he cooperated with farms on the development of cheaper hygienically produced milk. Reacting to the critique of the *Warenwet* commission on the

²⁹ Koolmees, *Symbolen*, 182-193.

³⁰ De Graaff was also the colleague of Dirk Aart de Jong during his experiments on the effects of milk pasteurisation on TB bacteria (see chapter 2, p. 20).

³¹ NA, 2.15.37 DPH, inv. nr. 493 Stukken betreffende de instelling en benoeming van de Commissie ingevolge artikel 17 van de *Warenwet* 1920-1950 (Documents regarding the installation and appointment of members of the Commission according to article 17 of the *Warenwet*), Official decree on the members of the Commission for Advice on the *Warenwet*, July 30, 1920. The other four academic members appointed were: Prof. dr. C. Eykman, professor in hygiene at the University of Utrecht (and well-known for his discoveries on the vitamin deficiency disease beriberi in the Dutch East Indies); dr. P.A. Meerburg, head of the chemical-pharmaceutical department of the Central Laboratory for Public Health in Utrecht; dr. G.L. Voerman, head of the State Bureau for the Inspection of Commodities in Leiden; dr. F.H. Van der Laan, head of the local inspection service in Utrecht. In September 1920, also J.B.M. Coebergh, Pharmaceutical Chief Inspector of Public Health was appointed a scientific member of the commission (Official decree of September 8, 1920).

³² NA, 2.15.37 DPH, inv. nr. 493, Letters commission *Warenwet* to Minister of Labour Aalberse, November 12, 1920, and December 14, 1920; Official decree on the appointment of extraordinary members in the commission for advice on the *Warenwet*, January 12, 1921. Van Oyen was appointed one year later, together with more representatives of agricultural organisations: Official decree on the appointment of extraordinary members, January 31, 1922. See also: NA, 2.15.37 DPH, inv. nr. 329, Letter Milk commission to Minister of Labour, May 29, 1921[3], 2-5.

model milk decree, Van Oyen argued that the inspection of milk should be left in the hands of experts employed by the model farms themselves. The other members reacted surprised to this statement, and insisted that the inspection should be carried out by the government.³³

Van Oyen tried again to gain veterinary jobs in model milk inspection during the second half of 1920s. New jobs were needed, as veterinarians saw their work opportunities decline due to disappointing trade results in agriculture, and the disappearance of the horse as a result of mechanical means of transport. Cars were for instance becoming more popular in the Netherlands after World War I.³⁴ As “The last generation veterinarians can praise itself to have added the subject of meat inspection to their tasks systematically, this generation should attain the same regarding milk hygiene.”³⁵ A well-educated veterinarian could perform both the inspection of animals and bacteriological inspection of the milk, which would be an advantage over Williams' system in Reading, where two experts were needed. This argument fitted into developments at the veterinary school to become more 'scientific' by focussing on bacteriology. Kroon had comparable ideas on the usefulness of veterinarians. Veterinary inspection of the milk farms and animals would help to improve the quality of the milk. Model farms for the production of infant milk were best lead by veterinarians, as they were “officials to whose proper field of activity it belongs.”³⁶

In the discussions on the model milk decree between the Health Advisory Council and the *Warenwet* commission, Van Oyen's argument that the Veterinary State Supervision or the veterinarians responsible for the meat inspection could be used in milk inspection, was not received with enthusiasm. As one of the reasons why the model milk decree would be too difficult to implement, the *Warenwet* commission brought up the need for independent veterinarians for the inspection of farm conditions. The employment of veterinarians by the food inspection services would be too expensive.³⁷ The chairman of the milk commission of the Health Advisory Council Van Meerburg – a chemist himself – commented “that this is a matter of the old fight: veterinarian or chemist.”³⁸ Veterinarians had no authority based on the *Warenwet*, and could not use their authority as defined in the Meat Inspection Act for the inspection of milk. Van Leersum did not think a lot of new veterinarians needed to be employed anyway. Veterinarian Berger however stressed the need of two veterinary inspectors (one working for the farm and one for the government), which would mean more veterinary officials were needed than Van Leersum expected. Eventually, it was concluded that safeguarding model milk production, would mean “large financial sacrifices” for veterinary inspection.³⁹

Physicians did not agree with the dominating influence of chemists on the inspection of food either. In a discussion of the final milk decree of 1925 for instance, physicians criticised the lack of medical expertise in the inspection services responsible for milk inspection. The commission argued that by entrusting the inspection of food products in the hands of chemists via the *Warenwet*, “the unity of control of epidemic diseases is broken in this country”. The control of contagious milk diseases was partially entrusted to chemists rather than medically trained epidemiologists. These

³³ NA, 2.15.33 HAC, inv. nr. 436, Letter Van Oyen to Jitta, December 11, 1928, 1; Minutes, December 13, 1928, 2; Anonymous, 'Commissie voor Melkhygiëne', *NTvG* 67 (1923) 525.

³⁴ Schuurisma, *Jaren*, 28-8, 260.

³⁵ Van Oyen, 'De melkwinning' 373. Dutch quote: “De vorige generatie van dierenartsen mag zich er op beroemen het gebied der vleeschkeuring systematisch aan hunne werkzaamheden te hebben toegevoegd, het is aan deze generatie om op het gebied der melkhygiëne hetzelfde te bereiken.”

³⁶ *Ibidem*; Offringa, *Van Gildestein*, 167-8, 257-8; Kroon, 'De hygiëne', 209-10; NA, 2.15.33 HAC, inv. nr. 436, Letter Van Oyen to Jitta, December 11, 1928, Dutch quote: “ambtenaren tot wier eigenlijk arbeidsveld zij behoort.”

³⁷ See chapter 4, p. 47, and NA, 2.15.37 DPH, inv. nr. 366, Letter *Warenwet* commission to Minister of Labour, May 29, 1928.

³⁸ HAC, inv. nr. 436, Minutes, December 13, 1928, 3. Dutch quote: “dat het hier gaat om den ouden strijd: veterinaire of chemicus.”

³⁹ *Ibidem*, 3-5; Letter Van Meerburg to Minister of Labour, January 7, 1929.

chemists could not work without “the help of an epidemiologist, c.q. of a bacteriologist-hygienist”.⁴⁰ However, a chemist employing a medically trained epidemiologist was unthinkable. That managers of inspection services were legally responsible for the control of contagious diseases was “incorrect, as only a physician can develop into a good epidemiologist and an epidemiologist should be in charge.”⁴¹

Although they did not want to advocate the British system, in which the medical officer of public health was mainly in charge of the inspection of foodstuffs, these physicians did think a supervising role for physicians necessary when contagious diseases were concerned. It did not mention a role for veterinarians in the control of epidemic disease, however. To illustrate their superior expertise on medical matters, the physicians pointed out the dangers of several contagious diseases among humans which were missing in the milk decree (typhoid fever and paratyphoid were mentioned): dysentery, diphtheria, scarlet fever and open tuberculosis. Although bovine tuberculosis was mentioned as a dangerous milk infectant in the milk decree, the commission thought “the spread of human tuberculosis via milk, which has been infected by sufferers of open tuberculosis” equally important.⁴²

The chemists in charge of the inspection services and many physicians and veterinarians seem to have disagreed on the dangers of milk pasteurisation for public health. The social hygienic medical commission criticized for instance the definition in the milk decree of child milk as pasteurised or sterilised milk. It pointed out the negative effects of such milk on the health of infants and children. It argued the name “child milk” should have been confined to raw milk produced under especially clean circumstances with “non tuberculous cattle”.⁴³ The chemists in charge of the inspection services and the *Warenwet* commission supported the attempts of the Health Advisory Council in the second half of the 1920s to regulate inspection on model farming via a model milk decree, but they disagreed with the attempts to propagate the consumption of raw milk as healthy.⁴⁴ Eventually, the major reason why the *Warenwet* commission could not accept the model milk decree as designed by Van Oyen and Van Leersum, was its central focus on *raw* milk consumption.⁴⁵

This difference between the position of the medical professions and the chemical profession in Dutch food inspection might be an explanation for the different British and Dutch regulations on raw milk consumption. As in Britain medical officers of health were more in charge of food inspection, the medical ideals of raw milk consumption could probably more easily be translated in regulations on the use of certified milk which was guaranteed to be sound.⁴⁶ In the Netherlands, the professions mainly propagating the ideals of raw milk – physicians and veterinarians – had little influence on food inspection due to the dominance of chemists, who seem to have been less convinced of the benefits of raw milk consumption, and generally showed great reliance on techniques of heating the milk. This issue is an interesting topic for further research.

5.3. Practice or theory? Farmers and veterinarians

The dairy industry followed the attempts to put the dairy industry under government control Argus-

⁴⁰ Horst a.o., 'Melkbesluit', 496.

⁴¹ *Ibidem*. Dutch quote: “onjuist, aangezien slechts een geneeskundige zich tot goed epidemioloog kan ontwikkelen en een epidemioloog de leiding behoort te geven.”

⁴² *Ibidem*, 492-500.

⁴³ *Ibidem*, 495.

⁴⁴ See for instance: NA, 2.15.37 DPH, inv. nr. 329, Letter J.D. Filippo as director of the local inspection service in The Hague to the municipal government of The Hague, November 8, 1921; NA, 2.15.33 HAC, inv. nr. 436, Letter J.D. Filippo as secretary of the *Warenwet* commission to J. Jitta, February 12, 1925; Letter commission *Warenwet* to Minister of Labour, May 29, 1928.

⁴⁵ NA, 2.15.33 HAC, inv. nr. 436, Letter commission *Warenwet* to Minister of Labour, May 29, 1928, 5.

⁴⁶ Atkins, *Liquid materialities*, chapter 10, 247-76.

eyed. The dairy industry consisted of both the producers of milk and the distributors of milk. I will treat both groups separately, starting with the farmers.

During the agricultural crisis of the 1870s, caused by exponential increase of wheat production in the US because of the expansion of transport by rail, many Dutch farmers changed from wheat production to dairy production. However, also dairy farmers faced sharp falls in prices in the 1880s, because of the growing national availability and increasing import of dairy through the use of new cooling techniques. The government assisted the farmers by improving the conditions in which they had to work: railways, agricultural education and the founding of a national representative organ of agriculture: the Dutch Agricultural Committee, later the Royal Dutch Agricultural Committee (*Koninklijk Nederlandsch Landbouw Comité*). Farmers themselves joined forces in cooperations, which became another incentive to change to dairy production. The first dairy cooperations were founded in Friesland. The number of dairy cows rose from about 900.000 in 1890 to 1.3 million in 1930.⁴⁷

For veterinarians, these changes meant more work. After all, farmers relied on an increasing number of animals: cows, but also pigs, poultry, and horses. The status of veterinarians among farmers was ambivalent, however. On the one hand, veterinary care was needed for all those animals. On the other hand, the therapeutic abilities of veterinarians were few (comparable to those of nineteenth century physicians), and successes of battling epizootics like rinderpest and lung disease were based on strict isolation and slaughtering measures rather than on therapeutic interference. Moreover, veterinarians were trained more in 'theoretical' subjects than in 'practical' ones, something that was looked at with particularly suspicion by farmers. Authority of veterinarians among farmers was far from self-evident.⁴⁸

Regarding the control of bovine tuberculosis, veterinarians and farmers did not always agree as well. A conflict on the trade of tuberculous cows by Frisian cattle breeders can serve to illuminate this. Frisian farmers were modern in measures to control bovine tuberculosis, during the same period in which the government attempts to control bovine tuberculosis based on the responsibility of farmers themselves were hardly successful. The Frisian cattle health service was founded in 1919 by Frisian farmers themselves, especially for the control of bovine tuberculosis among Frisian cattle.⁴⁹

The Frisian cattle health service was soon discredited in the rest of the country, as veterinarians and farmers accused Frisian cattle breeders of selling cows with closed tuberculosis (only visible through a positive tuberculin test) to other areas, mainly Northern Holland. The chairman of the health service E. van Welderen Rengers reacted to these accusations in the agricultural journal *De Veldbode*. He argued that “the expert veterinarian and the expert cattle farmer” agreed when open tuberculosis was diagnosed: such an animal should be immediately slaughtered to prevent spread of TB bacteria. However, when closed tuberculosis was concerned, farmers thought such an animal was still valuable economically, if it was kept under close inspection for signs of developing open tuberculosis. Frisian farmers themselves were willing to keep these animals under special care, so why should farmers from Northern Holland then be considered duped when they bought such a cow? Moreover, a positive reaction to the tuberculin test was always noted in the Dutch and Frisian herd books for a specific Frisian animal, and this practice should be extended to all cattle traded. When farmers from Northern Holland would pay more

⁴⁷ J. Bieleman, 'Het melkveehouderijbedrijf', J. Bieleman and A.H. van Otterloo eds., *Techniek in Nederland in de twintigste eeuw: landbouw en voeding* 3 (Zutphen: Walburg Pers, 2000) 99-100; Offringa, *Van Gildestein*, 159-66; Theunissen, 'Breeding', 643-4.

⁴⁸ Offringa, *Van Gildestein*, 167-71; 190-1, 244-5. During the preparation of the bovine tuberculosis eradication system 'Poels-Lovink' in the beginning of the 20th century, the Royal Dutch Agricultural Committee criticised the ignorance of “the objection of expert practical men, i.e. of agriculture itself”: NA, 2.19.120 RDAC, inv. nr. 6, Concept report on the draft of the bovine tuberculosis act, 1.

⁴⁹ Abbo-Tilstra, *Om de súnens*, 269-72.

attention to the quality of their breeding, the problem would be solved. Van Welderen Rengers saw the indignation of veterinarians mainly as a sign that the Veterinary State Supervision had too little work.⁵⁰

Van Welderen Rengers' letter caused a storm of protest among veterinarians, and the discussion in *De Veldbode* was continued for several months. Veterinarians were sensitive to the argument they had no practical expertise. They pointed at their expertise based on “science and practice”, and argued that the Veterinary State Supervision was the most reliable protector of “the interests of the Dutch livestock”, while the veterinarians of the Frisian health service only served Frisian interests. They did not once praise the Frisian attempts to get bovine tuberculosis under control. Rather, they pictured the health service as being responsible for letting the tuberculous cows move out of hygienic control. Its misconduct made a government ban on trade in tuberculous animals even more urgent. Van Welderen Rengers continuously pointed out that farmers had much more practical sense than the academically trained “technical” veterinarians in government service (like many farmers, he never used the word “officials” (*ambtenaren*) positively), who would probably “wipe out” all Dutch cattle when their plans “better suitable for a dissertation than for practice in the country” were executed.⁵¹

It would be easy to conclude from this argument that Frisian farmers were self-enriching hypocrites, while veterinarians were battling for the general good of public health. I want to nuance this vision of general public minded medical professionals versus money grabbing entrepreneurs that appears often in histories of public health. Theunissen has argued in line with agricultural sociologist Jan Douwe van der Ploeg that the ideal of 'sound farming' was very important for farmers, especially in Friesland, and this ideal also included disease prevention. Farmers saw tuberculosis-free cattle as a responsibility of farmers themselves: sound farming was essential in the prevention of disease, and good breeding was an essential element.⁵² Hence the emphasis of Van Welderen Rengers on the responsibility of farmers to buy certified cows from the herd book, and on taking good care of animals with closed tuberculosis.

The attack on the Frisian health service should moreover be seen in the context of the declining status of the Frisian cow breeds in the beginning of the twentieth century, which has been explained by Theunissen as well. The Frisian cow was highly productive, and became famous world-wide in the late nineteenth century. Farmers in other areas of the Netherlands bought these cows with high expectations. However, the Frisian cows turned out to be fit for the rich soil of Friesland, but not for the poorer soils in the eastern and southern Netherlands. The Frisian emphasis on high milk production was thought to deteriorate the constitution of the cows, especially regarding bovine tuberculosis. As a result, the reputation of the Frisian cows declined rapidly from 1900 onwards, and breeders in other parts of the country became more popular with their selection of more robust cows, which gave less milk but whose bodies were stronger in resisting tuberculosis infection. The Frisian cattle health service was part of the Frisian campaign to eradicate bovine tuberculosis from the Frisian herd to recover its reputation. Frisian breeders also started to select more robust cows (with the side-effect of lower milk production) from the 1910s onwards. The negative judgement on the Frisian cattle health service in *De Veldbode* was importantly influenced by the bad reputation of Frisian cow breeds as major sources of bovine tuberculosis.⁵³

The reaction of two non-Frisian farmers illustrates the different visions of veterinarians and farmers. These farmers condemned the Frisian farmers for the “unnoticed” trading of cows with closed tuberculosis, as the positive reaction to the tuberculin test was not communicated as a rule,

⁵⁰ E. van Welderen Rengers, 'Tuberculose-bestrijding onder het rundvee', *De Veldbode* 20 (1922) 11.

⁵¹ J.H. Picard, 'Tuberculose-bestrijding', *De Veldbode* 20 (1922) 23-4; E. van Welderen Rengers, 'Tuberculose-bestrijding', *De Veldbode* 20 (1922) 87; J.H. Picard, 'Tuberculose-bestrijding', *De Veldbode* 20 (1922) 135; K. de Vink, 'Tuberculose-bestrijding', *De Veldbode* 20 (1922) 220-1; E. van Welderen Rengers, 'Het tuberculose-vraagstuk', *De Veldbode* 20 (1922) 314.

⁵² Theunissen, 'Een mooie koe', 56-8.

⁵³ Theunissen, 'Breeding', 645-9.

but only in the expensive herd book papers. However, they did not argue for a complete ban on the trade like the veterinarians. The positive tuberculin test should be made *visible* by marking the animals. A farmer could then decide for himself whether or not to buy such cattle when it was made clear it suffered from closed tuberculosis. Although those farmers joined the veterinarians in criticising the Frisian health service, this critique was slightly different.⁵⁴

Another example can serve to illustrate farmers' feelings of expertise regarding the health of their animals. An indignant letter of farmer and agricultural journalist E. van Muylwijk in *De Veldbode* addressed the feelings among farmers on the slaughtering of their cows as a measure against the spread of foot-and-mouth disease (FMD), another disease that was thought to infect milk. FMD infected Dutch cattle regularly during the first half of the twentieth century. The slaughtering policy to eradicate FMD was carried out by an inspector of the Veterinary State Supervision from 1910 onwards to solve the problem, which was mainly of an economic nature.⁵⁵ Van Muylwijk wrote indignantly on “the god of the slaughtering system”, and noted: “In our region cattle farmers feel terror, fear and ... *hatred*. And rightly so!”⁵⁶ As Abigail Woods has shown, farmers saw FMD as a relatively innocent disease many animals could well survive.⁵⁷ In 1918, when the 'Spanish' influenza pandemic had not yet reached its highest death toll, Van Muylwijk compared FMD to 'innocent' influenza, “an equally passing small ailment”. Moreover, his reaction to the government funded financial compensation illustrates why many farmers were not satisfied with money alone. Van Muylwijk argued that financial compensation was not sufficient to repair the damage of the loss of many years' carefully breeding of cows. With money a farmer could only buy a number of worthlessly bred animals.⁵⁸ Van Muylwijk called for massive protests of cattle farmers against the slaughtering of their breeds. If this would not help, farmers should refuse to supply milk, despite negative consequences for “the sick and the weak”. Van Muylwijk pictured veterinarians as the main enemy: “The gloves are off, is the motto; the veterinary service can not be convinced with words; then we will see who is strongest!”⁵⁹

The suspicion of farmers as regarding the 'practical' authority of veterinarians can be found in discussions directly addressing milk hygiene as well. The different attitudes towards good farming, animal disease and trade meant farmers on the one hand and the scientific professionals concerned about milk diseases on the other had different opinions on the attempts to put the milk production under government control. This made the implementation of the milk decree into a subject that was long debated on: from 1920 until 1925. The discussion was held in high-level Dutch politics: the successive Ministers of Agriculture H.A. van IJsselsteyn (1918-1922) and Ch. Ruijs de Beerenbrouck (1922-1924) personally argued on the matter with Minister of Labour P.J.M. Aalberse (1918-1925).⁶⁰

As the Minister of Agriculture feared “the scientific-theoretical element” would be too

⁵⁴ H. d. H., 'Bestrijding der tuberculose onder het rundvee', *De Veldbode* 20 (1922) 63; E. Dez. Govers, 'Het tuberculose-vraagstuk', *De Veldbode* 20 (1922) 366.

⁵⁵ Bieleman, *Boeren*, 377-8; Offringa, *Van Gildestein*, 241.

⁵⁶ E. van Muylwijk, 'De mond- en klauwzeerbestrijding', *De Veldbode* 16 (1918) 805. Van Muylwijk wrote on the slaughtering: “Begrijpt men niet, welk gevoel men over zich krijgt, als men *al* zijn vee, tot kippen en katten inclusief, af ziet maken? Als men de producten van jarenlange fokkerij en teeltkeus in een paar uur door een paar bloedige slaggers tot een massa lillend vleesch ziet vervormen? Bij die menschen is de lust er uit ... voor goed! [...] niemand weet of hem morgen ook niet 't lot zal treffen dat zijn erf tot een groot bloedig offerblok zal worden gemaakt, waarop zijn levende have geofferd wordt aan den god van het afmaaksysteem. In onze streken is er schrik, vrees en ... *haat* onder de veehouders. En terecht!”

⁵⁷ Abigail Woods, *A manufactured plague? The history of foot-and-mouth disease in Britain* (London: Earthscan, 2004).

⁵⁸ Van Muylwijk noted on such cows: “koeien, die slootje springen, taai melken, kuren hebben, moeilijk kalven, 's winters stijf worden, dunne melk hebben, enz.”

⁵⁹ E. van Muylwijk, 'De mond- en klauwzeerbestrijding', *De Veldbode* 16 (1918) 805. The last quote in Dutch: “Hard tegen hard! zij 't parool; de veterinaire dienst laat zich niet bepraten; dan eens gezien wie 't sterkst is!”

⁶⁰ NA, 2.11.06 DA, inv. nr. 8, several letters.

heavily represented in the commission for advice on the *Warenwet*, he argued for the membership of six scientific members and six members “of practice”. Although chemist Schoorl did not think this staffing was ideal, he consented, with this difference that the 'objective' chairman (Schoorl himself) should not be part of the total of twelve members. With this, the Minister of Agriculture could agree. Six members 'of practice' were appointed as members of the *Warenwet* commission, among them a representative of a dairy in Rotterdam.⁶¹ Moreover, it was decided that milk needed some special extraordinary members with more expertise on milk: veterinarian Kroon, physician Van Leersum, and representatives of cattle farmers, of dairies and of small milk dealers were appointed as extraordinary members.⁶²

However, when milk was concerned, more 'men of practice' should be included in the discussions in larger numbers according to the Minister of Agriculture, especially cattle farmers and milk dealers. At first, the commission of the *Warenwet* was reluctant to include these representatives in the discussions on the milk decree, as it thought the milk production a subject “of pure hygienic character”, which belonged to the department of public health.⁶³ To their annoyance, representatives of large agricultural societies were involved in the discussion only a couple of months after the first draft of the milk decree had been completed by the milk commission in January 1921.⁶⁴

One of the main problems agricultural societies saw in this first draft, was the strong emphasis on the hygiene of the stables and the milking process, subjects that were thought vital by hygienists as I have shown in earlier chapters. The milk commission referred to the improvement of the situation in the stables as “the most difficult subject of the entire milk decree.”⁶⁵ Farmers felt attacked in their autonomy and trade, and did everything to prevent the intervention of government officials *inside* their stables.⁶⁶

An important argument to prevent stable inspection, was to point out that small farmers had too little financial means to carry out all the required changes in their stables. According to an article in the daily *De Telegraaf* in 1921, 70% of 220 000 farmers had less than 5 cows. According to the Dutch Farmers Federation (*Boerenbond*) “hundreds and hundreds” of such farmers existed. The strict requirements on stable design and hygiene would also mean new small farms could not be founded, farmers' societies argued. Rather, hygienic milk production should be promoted through government-sponsored education and improvements of the farming environment, rather than be

⁶¹ NA, 2.15.37 DPH, inv. nr. 493, Letters Minister of Agriculture to Minister of Labour, April 16, 1920, May 7, 1920 and May 29, 1920; Letter N. Schoorl to Department of Public Health, May 27, 1920. Members who represented 'practice' in the *Warenwet* commission were eventually: D.J. Van Houten from Weesp, member of the company C.J. Van Houten en Zoon, and member of the Dutch Upper Chamber; Simon A. Maas from the Hague, manager of the distillery v/h Simon Rijnbende & Zonen, chairman of the federation of Dutch factory societies; chemist dr. H.W.M. Nijdam from Heemstede, manager of Bensdorp's Cacao- and Chocolate factories; H. Liefinck Jhzn. from Amsterdam, one of the owners of the tobacco company J.H. Liefinck & Zn., and a member of the Dutch Chamber of Commerce (*Kamer van Koophandel en Fabrieken*); E.G. Schürman, chairman of the merchants' association in Rotterdam; J. Noordam, manager of the company Rotterdam Dairy. NA, 2.15.37 DPH, inv. nr. 493, Official decree on the members of the Commission for Advice on the *Warenwet*, July 30, 1920.

⁶² These later appointed representatives were the chairman of the Federation of Dairy farmers A.N. Vaandrager from Rotterdam; H. Beer of the Industrial Milk Society and manager of a dairy in Arnhem; and A. Balk, chairman of the National Federation of Dutch milk dealers from Haarlem. See NA, 2.15.37 DPH, inv. nr. 493, Several letters, 1920; Official decree on extraordinary members of the *Warenwet* Commission, January 12, 1921.

⁶³ NA, 2.15.37 DPH, inv. nr. 329, Letter *Warenwet* commission to Lietaert Peerbolte, the Director-General of the DPH, September 16, 1921, 1.

⁶⁴ Representatives of the General Dutch Dairy Federation (*Algemeene Nederlandsche Zuivelbond, F.N.Z.*), the Royal Dutch Agricultural Committee (*Koninklijk Nederlandsch Landbouw Comité*), Dutch Farmers Federation (*Nederlandsche Boerenbond*), Christian Farmers and Market Gardeners Federation (*Christelijke Boeren- en Tuindersbond*). Other extraordinary members were: a representative of the Society of Dairy Industrialists (*Vereeniging van Zuivelfabrikanten*), and veterinary professor Van Oijen. NA, 2.15.37 DPH, inv. nr. 493, Letter Schoorl and Filippo to Minister of Labour, December 14, 1921; Official decree on extraordinary members of the *Warenwet* Commission, January 31, 1922.

⁶⁵ NA, 2.15.37 DPH, inv. nr. 329, Letter milk commission to Aalberse, May 29, 192[3], 3.

⁶⁶ See for instance: NA, 2.11.06 DA, inv. nr. 8, Minutes, March 6, 1925, 1-4.

forced by external inspection.⁶⁷ Indeed, Dutch cattle farms were mainly small scale farms during the first half of the twentieth century. In 1910, on average 5,5 cows were held per farm, in 1953 this had only risen to 7,4 cows per farm.⁶⁸ Only during the 1950s, major up-scaling of Dutch agriculture would start, as a result of a new period of mechanisation, and new agricultural policy.⁶⁹ The political influence of the many small farmers increased through universal suffrage for men in 1917 and the rise of farmers federations, as agricultural historian Van Cruyningen has argued.⁷⁰

Farmers used scientific authority arguments in their own way. The Dutch Farmers Federation argued the government could never guarantee the milk was free from germs, and needed to advise boiling anyway. Furthermore, it argued that “the scientific leaders” considered human and bovine tuberculosis as different diseases, and therefore milk posed no “important factor” for the spread of tuberculosis. Only typhoid was a milk infection dangerous for human health, but those bacteria could be killed by boiling the milk, which everyone should do. Pasteurisation should not become compulsory, as heating the milk twice would damage the nutritious substances too much. Heating the milk at home before use would be the only “absolute guarantee” against infection.⁷¹ The large trust of consumers in heating the milk discussed earlier probably supported the farmers in these convictions. No important consumer demand for more hygienically produced milk existed in the Netherlands.

The *Warenwet* commission agreed that the parts of the milk decree on the improvement of stable hygiene would be removed or adjusted (for now), as it concluded that this would be useless without the cooperation of the farmers. Moreover, it thought a fast introduction of the milk decree necessary.⁷² The Minister of Labour himself was sensitive to the arguments, and personally presented changes in the draft decree to the Minister of Agriculture: the strict requirements to stable design would be removed, and farmers would be given more time to adapt to all the required changes. To encourage farmers to really do this, Aalberse proposed that they could only use the advertisement slogan “improved milk production” when they met the stricter requirements of stable design and hygiene. The mayor would be responsible for inspecting the farms concerned. Aalberse hoped to reach a compromise in which improvement of the milk production would occur in the longer run through “education” (*opvoeding*).⁷³

However, the agricultural organisations were still not satisfied. Aalberse's adjustments were not accepted, as he had kept the requirements to the production process of milk in place. The farmers' organisations argued these requirements should *only* count for farms that wanted to use the label “improved milk production” for their milk. With these comments, the farmers showed awareness that scientists aimed to change their farms into 'model farms', which was not entirely incorrect.⁷⁴ However, farmers deemed themselves the experts on milk production, and did not want to be told how to milk. A new concept milk decree was presented in July 1923. “Improved milk production” had been moved to a short article that needed expansion, on which Aalberse was willing to discuss with the agricultural organisations. Eventually the discussion on this article would

⁶⁷ NA 2.11.06 DA, inv. nr. 8, Anonymous, 'De uitvoering der Warenwet en de veehouders', *Nederlandsch Tijdschrift voor Melkhygiëne* 17 (1921) 208; NA, 2.15.37 DPH, inv. nr. 329, H. Ruijter, 'Rapport over het ontwerp-melkbesluit' (Report on the concept milk decree), July 22, 1922, 25-6, and attachment II.

⁶⁸ J. Bieleman, 'De georganiseerde rundveeverbetering', J. Bieleman and A.H. van Otterloo eds., *Techniek in Nederland in de twintigste eeuw: landbouw en voeding* 3 (Zutphen: Walburg Pers, 2000) 150, table 10.6.

⁶⁹ Bieleman, 'Het melkveehouderijbedrijf', 99-100; Theunissen, 'Breeding', 663.

⁷⁰ Van Cruyningen, *Boeren*, 285-7.

⁷¹ NA, 2.15.37 DPH, inv. nr. 329, H. Ruijter, 'Rapport over het ontwerp-melkbesluit', July 22, 1922, 10-1, 25.

⁷² *Ibidem*, Letter *Warenwet* commission to the Minister of Labour, May 29, 192[3], 3.

⁷³ NA, 2.11.06 DA, inv. nr. 8, Letter Minister of Labour to the Minister of Agriculture, December 11, 1922.

⁷⁴ After the first presentation of the draft of the milk decree to the farmers on June 16, 1921 (which was actually meant to remain confidential), the daily *De Telegraaf* wrote that some of the farmers present feared the concept milk decree would mean their farm had to become a model farm. As quoted in: NA, 2.11.06 DA, inv. nr. 8, Anonymous, 'De uitvoering der Warenwet en de veehouders', *Nederlandsch Tijdschrift voor Melkhygiëne* 17 (1921) 207.

be continued as the debate on the model milk decree in the late 1920s.⁷⁵

It took another two years before the milk decree was finally accepted, to the annoyance of the commission of the *Warenwet* and the Minister of Labour, who argued several times to make haste, as the issue of milk inspection was a pressing one.⁷⁶ However, farmers organisations were quite persistent in their argument that the plans for inspection at the farm by government “officials” should be given up. The representative of the Royal Agricultural Committee Croesen agreed that the government could impose certain quality requirements on milk, but it should not “put the entire agriculture business under supervision.” Farmers should have freedom of choice in *how* to come up to the requirements, as they had expertise on milk production: “The danger is not imaginary, that the supervision will be entrusted to officials, who have too little knowledge about the circumstances in which the production takes place.”⁷⁷

Nevertheless, farmers agreed in principle with the reasoning that stable hygiene was important for good milk production. The Farmers Federation argued: “Good milk can only be obtained, when it is produced well.”⁷⁸ The choice how to produce well, should remain in the hands of the farmers themselves, however. They thought it far better when dairy factories and farmer organisations rather than individual farmers would be put under inspection. The only farmers in need of inspection would then be those who did not have a membership of a farmer organisation or a milk cooperation.⁷⁹

The final milk decree meant inspection of milk's chemical composition, amount of contamination and the number of bacteria were now regulated at a national level. However, especially as stable hygiene and the milking process were concerned, the final milk decree contained little of the original draft by the *Warenwet* commission, and this was noticed.⁸⁰ In medical circles, the final milk decree was generally seen as a failure, especially as medical supervision would not penetrate to milk farms. The Society for the Advancement of Medicine was indignant the requirements to the hygiene of the stables were missing from the final decree, and the requirements to the milking process had been weakened. (The physicians compared the final decree to the draft of 1923, which had already been adjusted to the criticism of the farmers.) The article noted: “It seems one has feared to make heavy demands upon practice, especially on cattle farmers.”⁸¹ The Society for Veterinary Medicine commented the requirements in the milk decree were “extremely modest”, and regretted no opportunities for supervision of the stables were created.⁸²

Surprisingly enough, the milk decree was no subject for debate in the agricultural journal *De Veldbode*. It brought the news of the final milk decree as a positive topic. Farmers should be encouraged to learn the milk decree by heart, as the penalties were severe (“*niet malsch*”: a maximum fine of f2000,- or 6 months in jail). It also published some “preventive measures”. In essence these were the measures for hygienic milk production that were left out of the milk decree, like the best design of a stable (a group stable rather than a deep litter house (*potstal*)), clean hands and clothes, enough fresh air and light, cleaning of the animals, bacteriological inspection of the

⁷⁵ NA, 2.11.06 DA, inv. nr. 8, Letter Minister of Labour [to the Minister of Agriculture], December 11, 1922; Several letters between agricultural organisations and the Minister of Agriculture in 1923; Minutes of a meeting of the dairy commission of the Dutch Farmers Federation in Utrecht, published in: *Land en Vee* 17 (February 2, 1923) 1-2; Concept milk decree, June 14, 1923.

⁷⁶ See for instance: *Ibidem*, Letter Minister of Labour to Minister of Agriculture, March 25, 1924.

⁷⁷ *Ibidem*, Minutes, March 6, 1925, 2. Dutch quote: “Het gevaar is niet denkbeeldig, dat de contrôle in handen wordt gelegd van ambtenaren, die niet voldoende op de hoogte zijn met de omstandigheden waaronder de productie plaats vindt.”

⁷⁸ *Ibidem*, 3. Original quote: “Goede melk kan alleen worden verkregen, wanneer ze goed is gewonnen.”

⁷⁹ *Ibidem*, 1-4.

⁸⁰ See for instance: anonymous, 'Het melkbesluit', *Algemeen Handelsblad* (July 30, 1925) 2.

⁸¹ Horst a.o., 'Melkbesluit', 493. Dutch quote: “Het heeft de schijn, dat men bevreesd is geweest aan de praktijk, inzonderheid aan de melkveehouders, hooge eischen te stellen.”

⁸² H.A. Vermeulen and J.J.F. Dhont (Maatschappij voor Diergeneeskunde, Society for Veterinary Medicine), 'Het Concept-melkbesluit', *TvD* 52 (1925) 187.

milk by the local inspection service and no use of canal water, or if a farmer had nothing else, boiled canal water. These measures were much like the measures advised by medical professionals. This article was probably written by one of the editors of the journal, veterinarian A. van Leeuwen.⁸³

Moreover, hygienic milk production as ideal seems to have appealed to farmers. The improvement of the hygiene of the milk production was generally referred to as something worth aspiring to by the readers and writers of *De Veldbode*. Farmers were generally in favour of the existence and founding of model farms as exemplary farms as well. The founding of new model farms was called “a major interest for agriculture”. The Frisian local authorities wrote to the Minister of Labour in 1926 to press the implementation of a special decree on 'improved milk production' (the model milk decree), as Frisian farmers had started to improve their milk production on their own.⁸⁴ Farmers also thought the milk decree itself provided opportunities for improvement of the milk production. For instance, a society for “improved milk production” was founded by “prominent cattle farmers” like A.N. Vaandrager (one of the extraordinary members of the *Warenwet* commission on milk) in Rotterdam, with the aim of “working educationally in the direction of the milk decree”.⁸⁵

Despite this interest in improvement of the milk production in agricultural circles, the large changes in the original hygienist milk decree due to agricultural lobbying against top-down inspection of stables and the milking process, did not improve the image of farmers in the eyes of hygienists. Hygienists continued their attempts to legalize requirements on the hygiene of the stables and the milking process in the discussions on the model milk decree in the second half of the 1920s. In this context, the secretary of *Warenwet* commission on milk, Filippo, called the discussions on the milk decree with agricultural representatives a “sad history” and a “disappointment for hygienists”. Therefore, Filippo agreed with the attempts to write a model milk decree, although he did not believe in the possibility of safe raw milk consumption and was sceptical about agricultural cooperation. In the discussions on model milk, the distrust of hygienists towards farmers remained to play an important role. This is illustrated for instance in worries on the practices of “fake model farms” (*schijnmodelboerderijen*). The battle for inspection at the farms was continued, as civilisation of farmers had become even more pressing.⁸⁶

5.4. The middle ground: milk traders

Milk traders were a diverse group. Milk, butter and cheese were processed and sold by rural cooperations of cattle farmers called dairy factories (*zuivelfabrieken*). In the cities, dairies (*melkinrichtingen*) were founded meeting the growing demand for consumption milk. Van Otterloo argues that the founders were highly-educated city-dwellers, and my sources confirm this picture.⁸⁷ These companies generally paid a lot of attention to the quality of their products. Urban dairy factories existed as well, and often dairies and dairy factories were combined. Those urban dairies and factories could buy their milk directly from farmers, or from a rural dairy factory. As the Society for Dairy Industry and Milk Hygiene (*Vereeniging voor Zuivelindustrie en Melkhygiëne*)

⁸³ Anonymous, 'Het melkbesluit', *De Veldbode* 23 (1925) 979-80.

⁸⁴ Anonymous, 'Modelboerderijen', *De Veldbode* 19 (1921) 605; A.A. ter Haar, 'Mest- en gierbewaring', *Veldbode* 18 (1920) 8-9; H.M. Kroon, 'Scholen voor melk- en stalpersoneel', *Veldbode* 18 (1920) 873-4; J. Nijpels, 'Het machinaal melken', *De Veldbode* 23 (1925) 60; J. Nijpels, 'Het machinaal melken II', *De Veldbode* 23 (1925) 835; NA, 2.15.37 DPH, inv. nr. 531, Letter Provincial Executives of Friesland to the Minister of Labour, December 29, 1926;

⁸⁵ Anonymous, 'Vereeniging voor Verbeterde Melkwinning', *Algemeen Handelsblad* (morning January 24, 1926), 2; *De Tijd* (January 25, 1926) 6. Dutch quote: “opvoedend te werken in de richting van het melkbesluit”.

⁸⁶ NA, 2.15.33 HAC, inv. nr. 436, Minutes, March 21, 1925, 7; Letter Filippo to Jitta, February 12, 1925; Letter *Warenwet* commission to the Minister of Labour, May 29, 1928.

⁸⁷ Van Otterloo, *Eten*, 69-71.

noted in 1923: “It occurs very regularly, that for instance a dairy or dairy factory in Rotterdam, The Hague or Amsterdam buys milk from a factory in Brabant or Gelderland.”⁸⁸ Individual milk traders also existed, they were generally called milk sellers (*melkslijters*). Selling milk took most often place at the front door (the sellers used bikes and wagons to transport the milk), but also at markets, or in special 'milk saloons'.⁸⁹

The Society for Dairy Industry and Milk Hygiene consisted of representatives of Dutch dairies.⁹⁰ It was in principle in favour of the attempts to improve the milk hygiene. Dairies generally presented themselves as feeling responsible for the product they delivered, and as reliable partners of the government in the attempts to improve the milk production. They were in favour of inspection of the quality of milk and its production by means of the *Warenwet*.⁹¹

Nevertheless, the society of dairies thought the medical ideal of hygienic milk aiming too high. In the context of a local debate on collectivizing the milk trade in the city of Amsterdam (where the socialists were relatively successful), the society critically commented: “After all, the municipality can hardly leave the milk production to experienced nurses in an operating room!”⁹² The attitude of farmers was a problem, as they did not understand the importance of science based “purity measures needed for a good milk production”. Education was needed in order to improve this situation, and, the society argued, “This process is well under way”. The “gradual” improvement of both the milk and its production should be left in the hands of milk producers and dairies themselves, with financial incentives and discounts, and education of cattle farmers. The attempts of the government to protect small farmers in the milk decree were thought unfair, as milk sellers would be blamed for the quality of the milk production for which farmers should be held responsible in the first place.⁹³

Indeed, the relation between dairies and farmers was not always peaceful. The bigger milk and dairy dealers had a large influence on the price of milk, which was generally felt to be too low by farmers, and, they argued, would not improve the quality of the milk produced in the agricultural areas surrounding the large Dutch cities.⁹⁴ Several “milk wars” were fought between dairy farmers and milk traders during the 1920s.⁹⁵

Dairies saw small milk traders in the cities as the biggest threat to their own trade and the general improvement of the quality of milk. These small traders also included some farmers who distributed their own milk, although their number was declining due to growing urbanisation. Small traders were a major player in the milk supply of cities. In Amsterdam small traders were for instance responsible for $\frac{2}{3}$ of the market.⁹⁶ According to the dairies, small traders were unable to

⁸⁸ NA, 2.11.06 DA, inv. nr. 8, Reaction of the Society for Dairy Industry and Milk Hygiene to the concept milk decree, February 22, 1923, 3. Dutch quote: “Het komt ... zeer veel voor, dat bijv. een melkinrichting of fabriek in Rotterdam, Den Haag of Amsterdam melk koopt van een fabriek in Brabant of Gelderland.” See for a more detailed description of the trade between dairies and dairy factories in different provinces: Reaction of the Society for Dairy Industry and Milk Hygiene to the concept milk decree, March 9, 1925, 3.

⁸⁹ Van Otterloo, *Eten*, 67-71.

⁹⁰ Blink ed., *De melkvoorziening*, 23.

⁹¹ NA, 2.11.06 DA, inv. nr. 8, Report of the Society for Dairy Industry and Milk Hygiene, February 22, 1923; Blink ed., *De melkvoorziening*, 39-44.

⁹² Blink ed., *De melkvoorziening*, 37. Dutch quote: “De gemeente kan toch moeilijk de melk laten winnen in een operatiekamer door geoefende verpleegsters!”

⁹³ NA, 2.11.06 DA, inv. nr. 8, Report of the Society for Dairy Industry and Milk Hygiene, March 9, 1925, 3-4; Blink ed., *De melkvoorziening*, 35-6, 44-9.

⁹⁴ See for instance: anonymous, 'Zuidhollandsche bond van melkveehouders', *De Veldbode* 19 (1921) 801.

⁹⁵ See for instance: anonymous, 'De “Melkoorlog”'. Veeboeren en melkslijters tegen de Melkinrichtingen', *De tribune: sociaal democratisch weekblad* 16 N° 157 (March 7, 1923) 4; Anonymous, 'Een nieuwe melkoorlog in de hoofdstad', *Het Leven Geïllustreerd* 18 (1923) 564; Anonymous, 'Een nieuwe melkoorlog', *Algemeen Handelsblad* (November 11, 1924, morning) 2; Anonymous, 'Melkoorlogen', *Algemeen Handelsblad* (February 24, 1926, evening) 2.

⁹⁶ This number was given by the municipal committee discussing the socialization of the milk distribution in

invest in sufficient technological innovation, which made it impossible to “decently” store, clean, cool, pasteurise, and research the milk, while dairies had enough capital, technology and scientific expertise to do this. Not all Amsterdam dairies actually met the ideal, the society agreed, but compared to small milk traders they had the means to meet the quality standards of regulations on milk once they would become operative. Moreover, small traders got their milk often from “middle men” (*tussenhandelaren*), who traded lower quality milk according to the dairies. The society supported its argument with data on the milk quality of different milk distributors, provided by the head of the Inspection Service for Commodities of Amsterdam. Small traders, wholesalers and farmers sold 6.77%, 9.88% and 8.42% milk “of inferior composition”, while dairies sold only 1.53% “inferior” milk.⁹⁷ The dairies argued small dealers should limit themselves to the trade in bottled, “properly processed milk”, of course provided by “well equipped and organized dairies”.⁹⁸

Indeed, small milk traders were not enthusiastic about the regulations of the milk decree, just like small farmers. They pointed out they had too little means to meet all the requirements. However, their complaints were not listened to, contrary to those of small farmers. Small milk dealers were under-represented compared to small dairy farmers and larger dairies, and they did not succeed in lobbying successfully for their cause. In the 1930s, dairies continued to discredit small traders, for instance by pointing out practices of advertising for tuberculosis-free milk by small traders.⁹⁹ According to the dairies, these practices should be prohibited, as they were liable to abuse. Dairies were the only sound milk traders who could guarantee a supply of hygienic milk.

As I have shown, the question who 'owned' the milk problem did not get a clear answer during the years in which the milk decree was written. Hygienists were arguing among themselves which discipline should be given highest authority on the legal level of milk inspection: medicine, as human health was concerned, veterinary medicine, as animal diseases threatened a product of animal origin, or chemists, as milk was a chemical substance. In the 1920s, chemists were most successful, as they were in charge of the *Warenwet* as commodity inspectors. However, physicians and veterinarians used the 'tame' milk decree of 1925 to point out the limits of chemical expertise. They were quick to start new discussions on 'improved milk production', aiming to come up with a *model* milk decree. In essence, this model milk decree was written like the milk decree should have been according to the medical professions. It failed however, as it failed to meet the hygienists' highest standard of risk elimination as contagious diseases were concerned. Veterinarians moreover faced the problem that their animal patients were attributed less value than human patients. Although in theory animals were thought to spread disease to humans, practical measures were met with resistance.

Between scientists on the one hand and farmers on the other, another battle was fought. This one centred mainly on the authority over the cow stables. Although farmers were not against improvement of the milk production as such, they vehemently opposed attempts by hygienists to supervise cattle farms. They had financial reasons for this, but deep convictions on sound farming were of importance as well. Their expertise was based on 'practice', as opposed to the 'theoretical' or 'technical' expertise of scientists. Farmers won the battle as inspection of the milk production was concerned: the supervision of the stables and the milking process were largely left in their own hands. The discussion on 'model milk' in the late 1920s should also be seen as an attempt to enlarge the authority of scientists over farms.

Dairies took the middle ground in the debate. They were in favour of legal regulations on milk hygiene, as they presented themselves as allies of scientific experts and the government in

Amsterdam, and referred to in: Blink ed., *De melkvoorziening*, 27.

⁹⁷ Blink ed., *De melkvoorziening*, 31.

⁹⁸ *Ibidem*, 26-31.

⁹⁹ NA, 2.15.37 DPH, inv. nr. 366, Several letters from the 1930s, for instance the Society for Dairy Industry and Milk Hygiene to the Minister of the Interior, November 29, 1934.

attempts to improve milk production. However, they also argued for slow changes, as 'incapable' farmers needed time to adjust to modern scientific insights and technological innovations. But the exceptional position of the small farmers lobby was criticized, as milk traders would be blamed for the faults of farmers. Dairies pictured small milk traders as parties with negative influence on the improvement of the milk quality. In general, dairies won with the milk decree, as requirements to the quality of milk strengthened their position in the market place. Indeed, urban dairies were successful in claiming this reputation of hygienic milk supply in scientific circles, as I will analyse further in the next chapter on the urban and rural aspects of the milk debate.

6. Bridging the rural-urban gap

As the debate on the milk decree centred around the issue of dairy farm inspection to secure a safe milk supply for urban consumers, rural-urban relations are of interest as well. Cultural images and meanings of cities and countryside had a large influence on the milk debate. The thesis of Cronon regarding the unity of urban and rural areas, and the thesis of Jones that bovine tuberculosis changed from an urban problem into a rural one in the beginning of the twentieth century, have been my main inspirations.¹ I will argue that an urban-rural boundary, both existing and perceived, influenced the debate on milk during the first decades of the twentieth century.

6.1 The complex route of milk

Sociologist Van Otterloo uses the model of anthropologist Jack Goody to analyse the changes in the 'cycle' of food in her study of Dutch food consumption during the nineteenth and twentieth century. Goody distinguishes four phases in this food cycle, and relates them to social conditions. In the first two phases, production by farmers and distribution by traders, most importantly political and economical factors are centre stage. In the third phase, preparation (mainly by women), division of labour and social inequality are important social themes according to Goody. In the fourth phase, consumption, cultural eating customs play a role. Van Otterloo shows that all those phases became more complicated during her period of study. The chains of interdependence became longer, as more people, buildings and machines became involved in all phases of the food cycle. During those centuries the food cycle also became more connected to a 'civilising offensive', as Van Otterloo argues after Norbert Elias.²

This model is useful as it provides a simplifying tool to discuss changes of interdependencies in society that are often collectively described as industrialisation and modernisation. The four stages along the route of milk from producer to consumer can be placed in geographical domains in modern society: the production is largely rural, the preparation and consumption are largely urban, and the distribution forms the bridge between the two domains. The downside of simplification is that it tends to overlook different shades and nuances in its categories, and tends to stress the differences between categories. By stating that mainly economical and political factors are at work in the production and distribution of food, and cultural factors in eating it, a division is created which is problematic. Compare for instance the ideal of good farming among farmers, as discussed in the preceding chapter. This can hardly be called political or economical. Farmers were not one uniform group either, but socially stratified and adapted to the local environmental circumstances of their land.³ Moreover, the different phases in Goody's model influence each other and are no static entities.

Moreover, I want to argue that a fifth phase can be distinguished in the food cycle, concerning the result of food consumption: health or illness. In this phase the medical and veterinary professions and the social authority of science are important. I will argue in this chapter that the medical image of milk infection is influenced by the rest of the changing milk cycle, but also that the medical professions itself have influenced the milk cycle in the first decades of the twentieth century in a profound way.

The route of milk from producer to consumer was experienced as rapidly changing. Physicians

¹ Cronon, *Nature's metropolis*; Jones, 'Mapping'.

² Van Otterloo, *Eten*, 5, 257-262. For changes in the food chain during the modern period, see also: Yves Segers, Jan Bieleman and Erik Buyst eds., *Exploring the food chain: food production and food processing in Western Europe, 1850-1990* (Turnhout: Brepols Publishers, 2009) 14-5. These scholars distinguish lengthening, differentiation, narrowing and change of power as important changes of the chain.

³ Van Cruyningen, *Boeren*, 26-28.

discussed the immense complexity of the milk route due to urbanisation, and the hygienic problems during the milk production at farms as the main problems surrounding the hygiene of milk. They noted “gigantic opportunities for contamination and infection of the milk”, as milk was transported over long distances and handled by many individuals. Milk infection therefore threatened large groups of the population. Medical inspection of the milk trade was thought necessary, as the many steps in the milk production chain enlarged the risks of contamination and infection along the way.⁴ The reason why the model milk decree was eventually not passed in the late 1920s, had little to do with a lack of popularity of model farms in medical and veterinary circles, but with the high risks of infection along the complex milk route.⁵

In 1938, the General Society for Milk Supply (*Algemeene Vereeniging voor Melkvoorziening*), a cooperation of several societies of milk traders, among those the Society for Dairy Industry and Milk Industry, discussed the history of the milk trade until 1932 in its annual report.⁶ Although this history must be read with some reservations as it mainly served to explain the salutary effects of the Society (and the milk trade) on “the general good”,⁷ in it there was clear emphasis on the development that the milk trade was becoming more complex as a result of urbanisation. The countryside was the natural and only possible location for milk production, as it was impossible to produce milk in a “pure and practically sterile factory”. However, consumers of milk were concentrated in cities. “This means transport over relatively long distances, and consequently mobilizing a very large number of people for production, transport and distribution.”⁸

The complexity of the milk chain provided many points of possible contamination or infection of milk, and complicated the supervision of its quality. Nevertheless, not all points along the complex milk chain were considered equally dangerous. The production places of milk – farms – were considered to be most dangerous to the quality of milk. This was not only the result of the simple fact that farms were the primary source of milk.

6.2 The 'modern' city versus the 'backward' countryside

The countryside was looked down upon by scientists, trained in universities in the cities. For instance in the State Committee on tuberculosis, the countryside was pictured as an area swarming with flies, having a high tuberculosis incidence (both among humans and animals), lacking modern sewage, water and electricity facilities, and accommodating people with a distinct psychology, who were generally less civilized than urban citizens. An illustrating example is a comment of one of the members of the subcommittee for the direct control of tuberculosis. He argued that rural areas often showed a larger danger of tuberculosis infection, as country folks had the uncivilised custom to spit on the ground uninhabited.⁹

In medical journals a similar picture of the countryside was painted.¹⁰ In the journal *Tuberculose*, a 'house visitor' described the home environment of a tuberculous patient and her family in the countryside in very negative terms. She concluded it was a “situation beyond

⁴ Chief inspector of public health, 'Bestrijding', 349; Moll van Charante, 'De zorg', 788, Dutch quote: “reusachtig veel gelegenheid tot verontreiniging en tot besmetting der melk”; Horst a.o., 'Melkbesluit', 498.

⁵ NA, 2.15.33 HAC, inv. nr. 436, Minutes, December 13, 1928, 8.

⁶ NA, 2.11.06 DA, inv. nr. 8, Blink a.o., *Beschouwing*, 7-18.

⁷ *Ibidem*, 5.

⁸ *Ibidem*, 11. Dutch quote: “Dit beteekent vervoer over relatief groote afstanden. Bij elkander beteekent dit inschakeling van een zeer groot aantal menschen bij productie, vervoer en distributie.”

⁹ NA, 2.27.14 SC, inv. nr. 33, Minutes, February 1, 1919, 97, 102; May 30, 1919, 215; June 13, 1919, 260; November 21, 1919, 349-50, 356 (the particular example); NA, 2.27.14 SC, inv. nr. 43, Notulen van de Subcommissie voor de behandeling van de lijders 1918-1920 (Minutes of the Subcommittee for the treatment of sufferers), October 23, 1918, 5.

¹⁰ See for instance: J. Alma, 'Tuberculose-bestrijding op het platteland', *NtvG* 52 (1908) 1209; Moll van Charante, 'De zorg'; Anonymous, 'Een geval van vleeschvergiftiging', *NtvG* 69 (1925) 1165-6.

description, and then nobody who educated or supervised the family. [...] If one maybe never sees the 'spitting over the bed rim on the floor', here in the countryside it is still a custom."¹¹

Although many veterinarians were of farming stock, among them De Jong, the image of the countryside was not much better among veterinarians. The comparison of veterinarian Kroon of the Dutch milk farms with the Greek mythological Augeas stable, and his description of milk as liquid cow manure have been discussed already in chapter 2. Although Kroon acknowledged that some cattle farmers did look after their animals and worked in clean circumstances,¹² the general picture he gave of the countryside was negative. Kroon explained these abuses by both "ignorance" and "obstinacy and carelessness" of farmers. A thorough cleanup of stables and good education in hygiene of farmers and their farm workers in the rural areas of the Netherlands was necessary.¹³ In an evaluation of the Meat Inspection Act, veterinarian Berger complained on the slow founding of "emergency slaughtering locations" in "some rural municipalities" in 1925. His tone on the "obstinate" inhabitants of the countryside was authoritative and irritated. Berger was especially indignant to find a local policeman ignoring the regulations by appropriating "important quantities of meat declared unfit, be it according to his own words, for his dog."¹⁴ Even the authorities could not be trusted in rural areas!

Physician Van Leersum curiously compared medical work on a battle field to medical work in the countryside in the context of cheap, clean milk production in the fashion of Williams.¹⁵ He argued that although a clean environment was important, "this is not of primary concern if one is working with trained personnel, and expensive equipment of the operating room is redundant, as every physician in the countryside and every army physician on the battle field know from experience."¹⁶ The countryside was a filthy, backward area, in which the physician faced more difficulties than in the modern facilitated city, just like the filthy circumstances during a war posed more difficulties. Although Van Leersum thought model farms were too fancy, farmers did need to know the "rules of the aseptic method" to protect their milk, and as "laymen" they needed the supervision of academically trained professionals to overcome "their own notions on hygiene".¹⁷ Chemist Filippo also thought top-down regulations on the hygienic production of milk by "those wretched farmers" absolutely necessary.¹⁸

Although this negative image of rural hygiene has generally been accepted without much comment in historical studies,¹⁹ historians Bas van Bavel and Oscar Gelderblom have argued very convincingly that the proverbial cleanliness of the Dutch from the fifteenth century onwards can be explained from the importance of the dairy industry for Dutch culture. They argue that making

¹¹ Home visitor (*huisbezoekster*) Limburg, 'Hygiëne ten plattelande', *Tuberculose* 15 (1919) 84. Dutch quote: "Onbeschrijfelijke toestand, en dan niemand die daar voorlichting gaf of toezicht hield. [...] Als men misschien in Holland het 'spuwen over den bedrand op den vloer' niet of nooit zag, hier op het platteland is het nog eene gewoonte."

¹² Kroon, 'De hygiëne', 207.

¹³ *Ibidem*, 209-11.

¹⁴ H.C.L.E. Berger, 'Verslag van den Hoofdinspecteur bij het Staatstoezicht op de volksgezondheid, in het bijzonder belast met toezicht op de naleving van de Vleeschkeuringswet (Stbl. 1919, no. 524) over het jaar 1924', *Verslagen en Mededelingen betreffende de volksgezondheid* (1925) 1013-1032. Dutch quote: "Zeer ernstig was de ontdekking, dat een gemeentelijke politiebeampte op het platteland zich belangrijke hoeveelheden afgekeurd vleesch toeëigende, zij het dan ook volgens zijn eigen zeggen, voor zijn hond."

¹⁵ As discussed in chapter 4, pp. 40-1.

¹⁶ Van Leersum, 'Pure melk', 5. Dutch quote: "Het spreekt vanzelf, dat men ook in de omgeving zindelijkheid moet betrachten. Doch dat het hierop niet in de eerste plaats aankomt, indien er met geoefend personeel gewerkt wordt, en kostbare inrichting der operatiekamer overbodig is, weet iedere arts te platten lande en iedere legerarts te velde bij ervaring."

¹⁷ NA, 2.15.33 HAC, inv. nr. 436, Letter Van Leersum to Jitta, January 29, 1925, 1-3.

¹⁸ *Ibidem*, Minutes, March 21, 1925, 14, Dutch quote: "die stumpers van boeren"; Letter Van Leersum to Jitta, January 29, 1925, 1-3. See also Van Leersum's argument in 'Pure melk', 6.

¹⁹ See for instance: Atkins, *Liquid materialities*, 227; De Pree-Geerlings, De Pree, and Bulk-Bunschoten, '1901-2001', 2462.

cheese and butter is not possible without living and working in extraordinary clean circumstances. Hence the century-long reputation of the cleanliness of the Low Countries, in both rural and urban areas.²⁰

This undermines the negative image of the countryside and particularly of dairy farms in the eyes of early twentieth century hygienists. How can this be explained? Did farmers change their practices in the meantime? Van Bavel and Gelderblom note that the “direct link between dairy farming and cleanliness probably faded after 1600” as “dairy production shifted to large tenant farms.”²¹ With the rise of dairy factories in the late nineteenth century in dairy province Friesland, the practice of making butter and cheese at home was gradually abandoned. However, still more than half of the cattle farmers were practising butter and cheese making in the rural areas outside Friesland in 1906.²² These individual cheese makers were also supplying cities with consumption milk, especially in times of shortage.²³ Moreover, the dairy factories themselves needed clean milk in order to produce good quality products. The general shift from crop farming to dairy farming in the late nineteenth century might have resulted in worse hygiene practices, as former crop farmers did not know how to handle cows and milk. This explanation would count for particular areas of the Netherlands only, mainly the sandy areas in the east and the south. The veterinarians and physicians never pointed out such regional differences, however. To them, the countryside was a uniform area, defined by its not being a city. Moreover, the sandy areas of the Netherlands were relatively far away from the most densely populated areas in Northern and Southern Holland, which were dairy producing provinces for a longer time.

In the first place, I want to argue that the negative image of the hygiene in the countryside among physicians and veterinarians was the result of a relative rather than an absolute change in hygiene practices in the countryside. What used to be hygienic ceased to be so, as new hygienic models had developed in medicine as a result of new understandings of infectious disease through the rise of bacteriology. During the second half of the nineteenth century, the idea took hold that the medical and veterinary professions could and should eradicate *all* germs to prevent disease outbreaks. Veterinarians turned to slaughtering policies, physicians to strict isolation and vaccination programs, and aseptic treatment became vital. These practices relied on the trustworthiness of well-trained, higher educated professionals. Dairy farmers that used to be praised for their hygiene, were now looked at with suspicion, as the risk was thought too high that one of those low-educated people did not follow the strict medical precautions. Moreover, the milk production relied on manure producing cows, also not the best guarantee for the aseptic circumstances the medical professions favoured. Farmers had different ideas on hygiene and how to keep disease in check. The attitude towards foot-and-mouth disease, however, shows that farmers also thought disease was within bounds acceptable, and could not and should not always be kept in check whatever the costs. The new hygienic models did not always correspond with practical common sense – hence the criticism of Van Leersum and Van Oyen that model farms were too luxurious – but they were powerful tools in the hands of the rising authority of public health officials. Hygienic milk production was no longer thought to be safe in the hands of the rural farmer, but should be supervised by the experts in modern science.

Another question regarding Van Bavel's and Gelderblom's thesis might be: did the habits of cleanliness not survive the rapid changes of urbanisation and industrialisation during the latter decades of the nineteenth century? And related to this, was the scale of dairy farming increasing so fast, that larger amounts of cow manure and increasing unhygienic practices were the result? The scale of dairy farming did not increase importantly in the Netherlands until the 1950s, so this is no satisfying explanation for the negative image of farmers' hygienic practices. Nevertheless, profound

²⁰ Van Bavel and Gelderblom, 'The economic origins', 41-69.

²¹ *Ibidem*, 68.

²² Bieleman, *Boeren*, 382-90.

²³ See for instance: Anonymous, 'Opheffing van het kaasmaakverbod', *De Veldbode* 19 (1921) 220.

changes were occurring as a result of the increasing consumption of milk in the expanding Dutch cities. The rural areas surrounding the quickly growing urban areas in the western Netherlands were directly affected by this development of urbanisation, Bieleman has shown. The demand for consumption milk in cities rose quickly, and cattle farmers shifted to producing as much milk as possible. This meant they invested little time in the quality of their herds: as soon as the milk production of a cow decreased, it was sold and replaced. Hygiene and quality of the milk were under pressure under these circumstances. The trade of tuberculous Frisian cattle towards the provinces of Holland was a direct consequence of this high urban demand for consumption milk, according to Bieleman.²⁴

Consequently, the academic professionals in the cities were confronted with bad farmer practises indeed, but this had as much to do with incompetence of farmers as with the changing cities themselves. Nevertheless, the criticism of scientific professionals focussed on the supposedly inherently unhygienic behaviour of dairy farmers, and did not address the effects of urban changes. Cronon argues on the unity of rural and urban areas:

The market existed long before there was a Chicago, and although it attained new complexity in that city, it has since gone on to become a fact of life in most places, no matter how urban or rural.

We are consumers all, whether we live in the city or the country. This is to say that the urban and the rural landscapes I have been describing are not two places but one. They created each other, they transformed each other's environments and economies, and they now depend on each other for their very survival.²⁵

This economic process was of large influence on the circumstances of milk production in the Netherlands as well.

The hygienic milk problem had not always been a rural problem. Jones has shown that whereas milk adulteration and infection had been framed as an urban problem during the nineteenth century in the UK and the US, it became increasingly seen as a rural problem during the first decades of the twentieth century. Urban cowsheds were abandoned for hygienic reasons, and the urban demand for milk was met by an increasingly rural supply. Public health experts shifted their attention regarding the milk problem to the countryside accordingly.²⁶

In the Netherlands, my research shows, the milk problem was by then mainly seen as a rural problem as well. Although this rural problem was largely caused by urban economic changes, it was defined as a cultural problem of rural mentality and civilisation. In general, milk was thought to travel from a filthy, conservative rural environment to a modern urban one in which public facilities and scientific knowledge were far ahead. Getting the milk production in rural areas under medical and government control – be it in model farms or all farms – was therefore thought of uttermost importance. Indeed, this was one of the main incentives for the milk decree in the 1920s. As cities had little power over rural areas, the *Warenwet* commission argued to Minister Aalberse of Labour, “[it] was impossible to combat evil at the place of production, namely the farm.”²⁷

6.3 The 'unnatural' city versus the 'natural' countryside

Despite the dominant negative image of rural hygiene, hygienists were not just negative about the countryside. It also served as an ideal for natural living, as opposed to the artificial living in the city. Problems like alcoholism, prostitution and general moral corruption were thought to be especially present in urban areas. Such sentiments were expressed by the same individuals who despised the

²⁴ Bieleman, *Boeren*, 390.

²⁵ Cronon, *Nature's metropolis*, 384.

²⁶ Jones, 'Mapping', 147.

²⁷ Moll van Charante, 'De zorg'; NA, 2.27.14 SC, inv. nr. 17, Memorandum by L. Heyermans, October 1919, 318; NA, 2.27.14 SC, inv. nr. 33, Minutes, November 21, 1919, 349-50. The quote of the *Warenwet* commission can be found in: NA, 2.15.37 DPH, inv. nr. 329, Letter *Warenwet* commission to Aalberse, May 29, 192[3], 1. Dutch quote: “was het niet mogelijk het kwaad te bestrijden op de plaats der productie, nl. op de boerderij.”

conditions of milk production in the countryside.

This paradoxical relation between city and countryside reveals the ambivalent sentiments people were experiencing during the decades that have been described by words as industrialisation and modernisation. During the same time in which the modernisation of society was propagated, signs of a counter 'back-to-nature' movement became visible. Rudolf Steiner advocated the anthroposophic vision on agriculture in the 1920s. During the late nineteenth and beginning of the twentieth century, the urban elite saw the life in the rural countryside as more ideal and healthy than the life in the city. The Dutch physician and novelist Frederik van Eeden founded for instance the rural colony 'Walden' near Bussum. This colony was populated by a mix of idealistic city-elite – little successful in farming the land and milking the cows – and farmers. Van Eeden was inspired by the ideas on quiet living in the natural wilderness of the nineteenth century American environmentalist Henri Thoreau. Interestingly enough his 'Walden' was founded in the same village where the model farm 'Oud-Bussum' was built some years later. The popularity of the environmentalist Society for the Preservation of Nature Monuments (*Vereeniging tot Behoud van Natuurmonumenten*), founded in 1905, is another example. This society cooperated with the General Dutch Federation of Cyclists (*Algemeene Nederlandsche Wielrijders Bond, ANWB*), illustrating a growing popularity of outdoor trips among city dwellers.²⁸

The rural origin of milk was also generally pictured as something positive. Milk was a 'natural' product, as it was produced by living animals. The urban environment was seen as a bad environment for milk production. Van Leersum noted in the meetings of the Health Advisory Council on milk that 70 to 80% of the Amsterdam cattle was tuberculous. Even this advocate of the use of raw milk argued that the milk of such cows should be artificially heated to kill the germs.²⁹ The General Society for Milk Supply also pictured the natural source of milk as something positive in the 1930s. When a machine would be constructed to turn plants into “an ideal food for humans”, this machine would turn out to be a cow. Milk was seen as having an “extraordinary place [...] in the production, distribution and food”, as it was unique in being an animal secretion. As one was dependent on the body of an animal for the production of milk, one relied on “the universal wisdom we find in nature” rather than on technology and industry for its production. To optimize this natural production of milk, cows should be held in their 'natural' environment, the countryside: “Milk can only be obtained from the animal body. This needs space, especially for its functional life and its nourishment.”³⁰

Also for people, the rural environment was considered healthy, while the urban environment was not. Physician Saltet noted in his hygienist textbook of 1913 that farm labourers subconsciously ingested more necessary proteins than labourers in urban areas. When such a farm labourer moved to the city, the shortage of proteins would give him an “unpleasant feeling” and drive him to a pub.³¹ Cities were a source of waste for the surrounding countryside. The first nature park the environmentalist society *Natuurmonumenten* bought was the lake 'Naardermeer', which was originally meant as a refuse dump for the city of Amsterdam.³² The member of the Advisory Health Council J.J. van Loghem argued for the “biological processing of household- and street dirt” as a hygienic solution for the waste problem. This would also improve the urban-rural relations, as “the rural municipalities are revealing an instinctive aversion to the matter the large city is excreting in

²⁸ Jan Fontijn, *Tweespalt – Het leven van Frederik van Eeden tot 1901* (Amsterdam: Querido, 1990) chapter 20; Van Otterloo, *Eten*, 195, 201; De Knecht-van Eekelen, *Zuigelingsvoeding*, 199; Schuursma, *Jaren*, 36-8; Auke van der Woud, *Een nieuwe wereld: het ontstaan van het moderne Nederland* (Amsterdam: Bert Bakker, 2006) 188-94.

²⁹ NA, 2.15.33 HAC, inv. nr. 436, Minutes, March 21, 1925, 7.

³⁰ NA, 2.11.06 DA, inv. nr. 8, Blink a.o., *Beschouwing*, 7, 10-11. Dutch quote: “De melk is slechts te krijgen uit het dierlijk lichaam. Dit heeft ruimte nodig, vooral ook voor zijn doelmatig leven en voor zijn voeding.”

³¹ Saltet, *Voordrachten*, 340.

³² Schuursma, *Jaren*, 37.

this way.”³³

In discussions on tuberculosis, the rural environment was thought to be an important part of the 'therapy' for tuberculous people or weak children. Agricultural colonies, forest and outdoor schools, garden villages, holiday schools, health colonies, and stays in tuberculosis-free (!) farm families were all examples of the ideal of the beneficial rural environment for the health of urban children and tuberculosis patients. Such a rural environment was a “better hygienic environment”, according to tuberculosis specialist Heynsius van den Berg.³⁴ Crowded Amsterdam on the other hand was described as a centre of tuberculosis. The State Committee on tuberculosis even feared the urban children sent to the countryside would be a source of infection in the countryside, and was therefore careful with advising massive outdoor trips for tuberculous city-dwellers.³⁵

This positive image of the countryside clashes with its negative image as a dangerous pool of germs in discussions on the hygiene of the milk production. This paradox can best be explained by assuming medical professionals saw a distinction between the rural environment and its inhabitants. The rural environment carried the positive connotations of naturalness, fresh air and light. However, the rural inhabitants could not be trusted in their dealings with this natural environment. According to the medical profession they needed medical supervision to make sure their dealings with products that would end up in the cities were hygienic according to scientific standards, especially when delicate milk was concerned. Farmers could easily spoil the beneficial effects of the rural environment and needed civilisation and education. In this way, the negative image of farmers, and the positive image of the natural countryside could co-exist. Supervision of farmers should ensure an optimal use of the natural rural and modern urban benefits. This attitude had one interesting side-effect: hygienists supported the rise of centralised commercial companies trading milk.

6.4 Hygienic centralisation of the milk trade

Before the *Warenwet* came into existence, municipalities had had the right to make their own rules on food inspection. Hygiene improving practices were encouraged by local urban regulations on the quality of food. In Amsterdam, the inspection of food was organised at the level of the municipality in the second half of the nineteenth century, a rarity in the Netherlands at that time. During the first decade of the twentieth century, municipal food inspection services were installed in other cities as well.³⁶ Modern facilities like sewerage, water works, and electricity were firstly installed in urban areas, as the need for such facilities was thought to be most urgent for these densely populated areas during the late nineteenth century. Therefore, the difference between rural and urban areas regarding food inspection and hygiene facilities was profound. In some sense, the countryside faced the 'the dialects of progress'. The call for scientific inspection of the milk production was mainly a call from the city to the countryside.

The Minister of Labour used this difference between cities and the countryside as a threat in the discussion on the milk decree. In March 1924, when the debate on the milk decree had already

³³ J.J. van Loghem, 'Biologische verwerking van huis- en straatvuil', *Verslagen en mededelingen betreffende de volksgezondheid* (1925) 1054.

³⁴ NA, 2.27.14 SC, inv. nr. 33, Minutes, June 13, 1919, 251.

³⁵ Dekker, 'Vergadering', November 11, 1917, 24; C. Dekker, 'Vergadering van de Nederlandsche Centrale Vereeniging tot bestrijding der tuberculose', December 14, 1917, *Tuberculose* 14, N°1 (1918) 57, 68; J.L.C. Wortman, 'Een landbouwkolonie als sanatorium', *Tuberculose* 14 (1918) 87-90; Anonymous, 'Verslag', 82; NA, 2.27.14 SC, inv. nr. 33, Minutes, November 22, 1918, 54; June 13, 1919, 247-252; Roëll a.o., *Verslag*, 94-5, 99-100.

³⁶ Van Otterloo, *Eten*, 69-71; De Knecht-van Eekelen, *Zuigelingenvoeding*, 195, 210-1; Koolmees, *Symbolen*, 273. The urban food inspection services were for instance founded in: Amsterdam (1879, although the first attempts originated from 1858), Leiden (1901), Nijmegen (1906), Den Haag & Dordrecht (1907), Groningen (1908), Leeuwarden (1910), Haarlem & Maastricht (1911), Utrecht, Hilversum, Amersfoort, 's-Hertogenbosch, Culemborg, Den Helder & Deventer (1913).

taken several years, Aalberse wrote his colleague of Agriculture that he worried about the effects of the absence of any regulations on the quality of the milk. He threatened he would give back local municipalities their power relating milk inspection, if the farmers would not agree quickly with the concept milk decree. The milk decree as adjusted by the agricultural lobby was “very tame” compared to the wishes of “somewhat radically tinged city councils like for instance the city of Amsterdam, not to mention other large cities”. When farmers would be subjected to the “quite radically hygienic considerations” of such local governments, they would have real reason to complain.³⁷

Dairies were founded in the cities to meet the demands for unadulterated, high quality milk in cities in the late nineteenth century. They aimed to sell 'pure', unadulterated, unskimmed and undiluted milk. These companies processed the milk of a lot of farmers. They were generally founded by highly-educated big-city dwellers. Dairies in Amsterdam were the first to offer pasteurised milk in the late nineteenth century, in close cooperation with physicians Forster and Jacob van Geuns who researched pasteurisation methods. These companies also used other techniques like sifting, separating and cooling. A well-known dairy from The Hague was 'De Sierkan', founded by the pharmacist J.Th. Mouton.³⁸ The famous Dutch novelist Louis Couperus mentioned a dairy, probably 'De Sierkan', in one of his novels. He described several manifestations of cleanliness and hygiene as characteristic for a rich neighbourhood in the Hague, and referred to the dairy in this context of prosperity: “the dairy, with its wagon of polished copper cans, ringed at every door”.³⁹

The need for quality distinctions between hygienically produced milk and contaminated milk was felt by dairies. This was also a consequence of the material qualities of milk when traded via such centralised companies. Unlike meat, milk could not easily be related to the cow responsible for its production, as it was traded as a bulk product by the larger dairies. The decentralised production of milk at many small farms was thus especially problematic, as the individual farmers could not easily be held responsible for contamination once the milk had been mixed with other milk. As Cronon has argued regarding the wheat trade in Chicago in which a similar problem was encountered, a general solution was to introduce quality grades to distinguish good quality wheat from mediocre and bad quality wheat.⁴⁰ In the milk trade in the Netherlands, a similar solution was followed. As the quality of milk related most importantly to hygiene, the grades of milk used by milk traders to distinguish the quality of their products from one another related generally to hygiene as well. Dairies emphasised the hygienic quality of their milk by pointing at special processing of the milk, e.g. 'pasteurised milk', and hygienically produced milk, e.g. 'model milk'. The *Warenwet* aimed to give such gradings legal basis.

Dairies communicated a negative image of the decentralised production of milk in the countryside and the decentralised trading of milk in the cities. In 1924, a dairy journal published an article on unhygienic practices at the Amsterdam milk market. The article discussed bad hygienic practices at the market as a continuing evil, starting in the late nineteenth century with unhygienic farmers, and continuing into the twentieth century with unhygienic small dairy traders “who traded the milk directly from the farmer”. The unhygienic circumstances were unheard-of for the capital city. The aim of the article was to end the milk market, as it was “a mockery of a good milk supply.” Moreover, “the dairies in Amsterdam have lost already a lot of terrain to the small milk dealers during the last couple of years.” The argument was supported by photographs meant to illustrate the severity of the situation. One picture showed a car rather than a milk wagon, which was noted to be the only sign of modernity at the entire milk market. In their report against the collectivization of the milk supply in Amsterdam, the Society for Dairy Industry and Milk Hygiene discussed small

³⁷ NA, 2.11.06 DA, inv. nr. 8, Letter Minister of Labour to the Minister of Agriculture, March 25, 1924.

³⁸ Van der Marck and Slot, *De geschiedenis*, 16-17.

³⁹ Louis Couperus, 'De kleine zielen', *De boeken der kleine zielen I* (Utrecht & Antwerpen: L.J. Veen B.V., 1987 [1901]) 110. Dutch quote: “de melkinrichting, met haar wagen van gepoetste koperen kannen, belde overall”.

⁴⁰ Cronon, *Nature's metropolis*, 132-42.

dealers in a similar negative way. They obstructed the further technological and hygienic development of dairies by competing with cheaper, but unhygienically handled milk.⁴¹

The discussion of the history of the dairy industry in the annual report of the General Society for Milk Supply also shows an illustrating vision on the need of centralising the dairy trade. The decentralised production of milk at farms and the centralised consumption of milk in cities was discussed both as a relatively recent phenomenon, and as a problem. In the recent past, cities had been small enough to enable the surrounding farmers to sell their own milk: a “primitive situation”.⁴² Growing urbanisation had two effects: the demand for milk increased, and the distance between producer and consumer increased as well. Although the production of milk at farms was thought to be a consequence of its source, the animal body, this environment posed severe obstacles for the ideal milk production. While “growing insights in hygienic issues”, particularly regarding milk “with its hygienically good and bad characteristics”, had encouraged the development of hygienically operating dairies in the cities, the success of such companies was obstructed by “unfair competition” of small dealers in irresponsibly cheap milk. As a “natural” solution to the problems of this decentralised dairy production and trade, the Society discussed centralisation of the milk trade in large, foreign cities (without calling them by name). To supply these cities with milk, an “organisation and equipment [was] required of such scope” that “mala fide and inhibiting elements” like present in the Dutch dairy trade had not survived. Rather, the milk supply was left “in few and very large hands”, making large-scale care for quality and hygiene possible. The Society did not want to propagate Dutch monopolies of “few very large companies”, but nevertheless it thought the effects of centralising the milk trade on its hygienic quality positive.⁴³

Indeed, hygienists saw urban dairies as important bastions between the urban consumer and the filthy rural production places of milk. After paediatrician Moll van Charante had extensively discussed the unhygienic circumstances at dairy farms, and the unhygienic attitude of “the farmer, who is not yet troubled by hygienic prejudices”, he noted the almost impossible task of urban dairies to turn this filthy rural product into something tolerable: “As such the milk enters the city. There it is partially taken over by a large dairy, which does what can be done to improve the contaminated product.”⁴⁴ The secretary of the *Warenwet* commission Filippo referred to *De Sierkan* as an example of a dairy trading milk of exceptional good quality.⁴⁵ Small milk traders were not thought trustworthy, as they did not have all the necessary equipment, and only sold seemingly clean milk. De Lange recommended “a large dairy which meets all hygienic requirements” as a more reliable milk company than “a small dealer, who obtains his milk from various places.”⁴⁶ Centralised urban dairies had the modern knowledge and technology to process the milk hygienically. Van Oyen was exceptional in arguing that farmers themselves could sell simply produced and bottled hygienic milk directly to consumers when following the method of Williams.⁴⁷ Generally, hygienists were in favour of centralising the milk distribution in dairies, as centralisation

⁴¹ NA, 2.11.06 DA, inv. nr. 8, Anonymous, 'De Amsterdamsche melkmarkt', *Nederlandsch Weekblad voor Zuivelbereiding en -Handel* 31 (October 28, 1924) 4; Blink ed., *De melkvoorziening*, 25-32.

⁴² NA, 2.11.06 DA, inv. nr. 8, Blink a.o., *Beschouwing*, 13. The General Society for Milk Supply noted that the Dutch name for a milkman still referred to this 'primitive' situation. In Dutch the milkman was (and still is, although he is disappearing) called 'milk farmer' (*melkboer*), although he was no farmer. “In het spraakgebruik leeft deze toestand nog voort, want in de steden noemt men nog iedereen die melk aan de huizen der consumenten komt brengen melk-'boer'. Toch staat in vrijwel alle gevallen vast, dat de man die de melk komt brengen [...] even weinig boer is als de dienstbode, die de melk in ontvangst neemt.”

⁴³ *Ibidem*, 10, 13-14, 17.

⁴⁴ Moll van Charante, 'De zorg', 789. Dutch quote: “Zoo komt dan de melk in de stad. Daar wordt zij gedeeltelijk overgenoomen door een groote melkinrichting, die er dan nog aan doet, wat er aan te doen is, om het vervuilde product te verbeteren.”

⁴⁵ NA, 2.15.33 HAC, inv. nr. 436, Minutes, March 21, 1925, 8.

⁴⁶ De Lange, *Het kind*, 142-3. Dutch quote: “[Het] is veel beter de melk te betrekken uit een groote inrichting, die aan alle eischen der hygiëne voldoet, dan van een klein handelaartje, dat zijn melk nu eens hier, dan weer daar vandaan krijgt. In zulk een klein zaakje is ook veel meer kans op besmetting met diphterie-, roodvonk- of typhusbacillen.”

⁴⁷ Van Oyen, 'De melkwinning', 371.

enhanced the possibilities of supervising and controlling the process, and as the founders of dairies belonged to the trustworthy elite, comparable to the initial founders of model farms.

The debate on milk in the 1920s was influenced by convictions on the meanings of both the city and the countryside, as milk production was thought to occur best in the decentralised countryside, and milk consumption occurred largely in cities where milk consumers were centralised. Both countryside and city had dual meanings in a world that welcomed modernity and industrialisation as progress, but feared these developments at the same time. The dual meanings of the countryside corresponded with the dual meanings of milk: on the one hand, they were both swarming with germs and dangerous, on the other hand they both represented naturalness and health. The boundary that was perceived between urban and rural areas regarding their notions on the handling of milk can in some aspects be seen as a construction. Rural developments and urban developments in milk production, distribution and consumption were closely connected through economic relations, despite the urban convictions that rural areas stayed behind in modern progress, or remained 'natural'. Centralisation of the milk trade in large dairies equipped to handle the milk hygienically was thought to be a necessary part of solution to the problem of easily infected and contaminated milk. Such large companies had the means to invest in technological innovations to improve the hygienic handling of milk. This reasoning was followed by both hygienists and large milk trading companies. This reveals relatively close relations between scientists and large-scale dairy industry, and foreshadows profound changes in urban-rural relations regarding milk.

7. Conclusion

Milk became the centre of scientific and social debate in Dutch society during the 1920s. The central question of this study has been why this was the case. This question can well be answered using the analytical social worlds framework of Adele Clarke, Joan Fujimura, and Susan Leigh Star. I aimed to discover the major social worlds involved in the controversy on milk, and how they related to each other. The groups involved in the debate defined themselves as different stakeholders, at the same time showing diversity, and can therefore be distinguished as social worlds. As milk embodied numerous and paradoxical meanings, it was a major boundary object for physicians, veterinarians, chemists, consumers, farmers and milk dealers. What picture of the Dutch milk problem in the 1920s comes to the fore?

The rising importance of bacteriology supported the shift of the image of contaminated milk as an adulteration problem into a problem of contagious disease. Veterinarians and physicians increasingly saw milk as a danger for public health because of its susceptibility for disease infection. Especially tuberculosis and typhoid fever bacteria were thought to threaten the milk. The growing recognition of tuberculosis as a zoonotic danger was illustrated by the appointment of veterinarian Dirk Aart de Jong as expert on animal tuberculosis in the State Committee on tuberculosis. Milk could be infected by people suffering from a contagious disease handling cows and milk, but also directly by cows suffering from disease, and according to De Jong even by other tuberculous animals, like birds. Moreover, dirt and disease were related, as bacteria were thought to thrive in filthy circumstances. Although pasteurisation was advocated and increasingly practised as a solution to the dangers of milk infection, public health experts feared that it was insufficient to destroy their toxins, or even to kill all harmful bacteria. Especially tuberculosis bacteria were thought to be resistant to heating. According to De Jong, the only way to control the animal source of disease, was to eradicate tuberculous animals through a system of compulsory reporting, and to improve the hygiene of the stables in which animals were held. These measures were much like the measures advocated for the control of human tuberculosis, except that tuberculous people should be isolated rather than slaughtered.

Despite the growing fears of milk borne diseases, milk was also seen as ideal food necessary for successful resistance of the human body against disease. It was seen as nutritious, easily digestible, naturally pure, and relatively cheap, making it an excellent food for 'the weak' in society: children, sick and old people, and in general the poor, underfed lower classes. For infants, cow milk was considered the best – or the least bad – substitute for mother milk. The resistance of calves and children against tuberculosis were regularly compared, as they were both 'natural' consumers of milk. During the 1920s, the image of milk as food for 'the weak' was shifting. The healthiness of milk was increasingly used in advertisement campaigns by the dairy industry. Milk's increasing popularity as a food for the general population rather than just its 'weak' members was illustrated by the slogan 'milk is good for everyone' (*melk is goed voor elk*). For the health improving characteristics of milk, pasteurisation was seen as a threat. Heating would damage milk's delicate nutritiousness, and turn the 'living', natural product into an 'artificial', less beneficial one. Especially the necessary animal proteins and the recently discovered vitamins were thought to be damaged by heating.

As a solution to the problems of pasteurisation, hygienists advocated general hygienic improvement of the milk production. Clean stables and healthy cows would mean no harmful bacteria, which made the drinking of unpasteurised milk possible. Scientific supervision was thought necessary to guarantee such clean circumstances. These ideals were practised from the beginning of the twentieth century onwards in model farms. At first, model farms were advocated and even initiated mainly by paediatricians. During the 1920s, hygienists increasingly presented

model farming as a general solution to the healthy milk problem. Veterinarian C.F. van Oyen and physician E.C. van Leersum joined forces in arguing for model farming with simple means, in order to save small farmers and consumers the high expenses of original model milk, which was produced in unnecessary 'luxurious' circumstances. By then, the word 'model' was not just referring to the extraordinary hygienic quality of the milk, but was also meant as exemplary: model milk illustrated how all milk should and could be produced. Central to the idea of model farming was scientific supervision of the production process.

However, model milk was very expensive and not very popular among consumers. Hygienists accused them of being ignorant of and indifferent to the hygiene abuses during milk production, as consumers were unwilling to pay higher prices for better quality milk. Nevertheless, housewives were aware of the need for hygiene in their households, and knew about the dangers of disease infection via milk. A good Dutch housewife was thought to combine hygienic housekeeping with cheap housekeeping. Housewives thought milk an excellent food for children and sick family members. Boiling the milk at home was generally practised as a sufficient means against harmful bacteria, which made extraordinary clean model milk unnecessary and too expensive, also in the eyes of well-to-do housewives. Dutch consumers therefore did not share the fears of American and British consumers that the remains of bacteria in heated milk would be harmful, as discussed by Susan Jones and Peter Atkins.

National regulations on the inspection of food and commodities in general and milk in particular were implemented during the 1920s. In 1919, the Meat Inspection Act and the *Warenwet* were accepted by Dutch parliament. The *Warenwet* regulated the inspection of food and commodities at state level in the Netherlands. The inspection of milk was worked out in more detail in the milk decree, which was accepted in 1925. As hygienists were not satisfied with the hygienic requirements of this decree, they tried to implement a model milk decree in the second half of the 1920s. Although the idea of improving the production circumstances of milk was welcomed by all scientific experts and government officials involved, the model milk decree was not accepted out of fear that the government could never guarantee that raw milk was bacteria-free.

The question who had authority over the milk problem was reason for long debate among several social worlds of 'milk experts' throughout society. Hygienists argued among themselves who should be the most important expert in milk inspection. Chemists, physicians and veterinarians had their own fields of expertise: chemicals, human disease and animal disease respectively. In the milk problem, these fields of expertise were combined in a single food product: milk was a chemical substance, it was produced by animals who might be ill, and it affected human health both in positive and negative ways. The milk problem therefore was an occasion for clashing authority claims.

Chemists had already gained a strong position in food inspection services in local cities, as chemical adulteration had been the major concern regarding the quality of milk and other food products during the nineteenth century. They were in charge of the Inspection Services established by the *Warenwet* as well. Pointing at the delicateness of milk regarding disease infection, both physicians and veterinarians claimed more influence in milk inspection. For physicians, claiming authority over chemists was a matter of medical prestige. They vehemently opposed the idea that a chemist would be in charge of a medical inspector when contagious diseases were concerned, as was the case with milk. Veterinarians were still in the process of 'elevating' their profession to academic status, using the word of C. Offringa, and their attempts to become scientific authorities in milk inspection should be seen in this light. Although the veterinary argument on the dangers of animal disease for human health was generally accepted by physicians, practical measures (for instance advocated by De Jong) met with resistance because of deep convictions on a difference in value of humans and animals. Veterinarians also aspired a central role in milk inspection, because this would mean a secured income. Due to the agricultural crisis and increasing motorization in

traffic and agriculture, veterinary job perspectives diminished. Both physicians and veterinarians were hardly successful in gaining influence on milk inspection during the 1920s, however. The model milk decree was another attempt to claim official authority over milk, but its failure illustrated the failure of the two professions to gain important influence. It was rejected by the government officials responsible for the *Warenwet*, mainly chemists.

Scientific experts clashed with farmers, the 'practical' experts on milk production. The requirements to the hygiene of stables hygienists thought central in milk inspection, were left out of the milk decree of 1925, as farmers protested successfully to the interference of scientific authority in their stables. In general, small farmers were the winners of the discussion on the milk decree. Especially the argument that small farmers could not afford the improvements to their stables and milking equipment proved to be influential. Care should be taken not to see the opposition of farmers inspired by financial reasoning only. Interference of scientific experts in their stables touched on many other sensitivities as well, as Bert Theunissen has already shown in his work on the history of Dutch cattle breeding. Farmers had outspoken ideas on the best ways of keeping healthy cows and milking them, and were reluctant to accept scientific supervision in these matters. This did not mean farmers were opposed to the use of scientific knowledge in their farming practices. They argued for education, exhibitions and contests in which scientific knowledge should be used to stimulate farmers to improve the hygiene of their milk production and the health of their cows. Many larger farmers, mainly from Friesland, were in favour of a model milk decree to distinguish their product on hygienic qualities.

Another diverse group involved in the milk debate consisted of milk dealers. Large dairy companies like the 'Sierkan' in The Hague were generally in favour of the quality standards of the milk decree, as those would mean severe restrictions on their largest competition in the trade of milk: individual urban milk dealers. Those small dealers opposed to the milk decree like the small farmers did: they did not have enough financial means to carry out all the necessary changes to meet the hygiene requirements of the milk decree. Small milk dealers were not as successful as small farmers, however. This meant that the trading environment of milk had to meet much stricter standards than the production environment of milk. The milk dealers thought this was unfair, as they would be held responsible for impurities in the milk which were stemming from the farms.

The debate on the milk problem had a geographical dimension as well. Bas van Bavel and Oscar Gelderblom have argued that the cleanliness for which the Dutch were well-known for centuries, can most convincingly be explained with the wide-spread practice of making butter and cheese, both in urban and rural areas of the Netherlands. Hygienists nevertheless used a remarkably negative discourse on the countryside when discussing the milk problem. This conflicting image of rural hygiene needs an explanation. In the first place, the aseptic ideals of the medical professions as a result of the new understandings of contagious disease in bacteriology, meant a relative change in understandings of hygiene. Once sanitary facilities had become standard in the quickly expanding cities, the countryside was looked down upon for staying behind. The combination of these concerns resulted in an urban image of the countryside as backward, stubborn and in need of modern, scientific supervision. These feelings were only strengthened once attempts to supervise the milk production with the milk decree were obstructed by farmers. In the second place, William Cronon's insight that urban and rural areas are intimately connected and can not exist without each other, making them rather one place than two, is of relevance for the negative image of the milk producing countryside in the Dutch 1920s. As Jan Bieleman has argued, the practices of cattle farmers directly surrounding the large cities, underwent radical changes as a result of large-scale urbanisation. The bad milk quality in urban areas was not simply the result of cultural, inherently bad farming practices, as hygienists implied. It was as much the result of economic changes in the cities themselves, which changed their milk hinterland accordingly.

At the same time, the countryside embodied positive qualities as well. The result was a

paradox: the countryside represented naturalness, health and peace as much as filth and danger of disease infection. This paradox can be explained with the understanding of the countryside as consisting of both natural elements and people. Countryside people could not be trusted, while their environment provided the health benefits of nature. Academicians trained in cities saw control over the inhabitants of the countryside as the ideal way to use the best of both worlds: modern, scientific progress from the cities and naturalness from the countryside.

An interesting consequence of hygienists' argument for supervision of the milk supply was they supported centralisation of the commercial milk trade in large companies, which enhanced the possibilities of supervision by scientific experts. In later years, this 'cooperation' between large-scale dairy commerce and the medical professions would become visible in extensive campaigns in which milk and health were connected. Programs to offer children milk at schools were for instance started in the 1930s. At the same time, developments to intensify and centralise the dairy industry in the second half of the twentieth century would be accompanied by increasing risks for contagious diseases dangerous for both humans and animals. The nutritious benefits of milk were increasingly doubted as well. Milk and its meanings for health remain promising topics for further historical research.

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Attachment

Milk decree (June 23, 1925)

Source: NA, 2.15.37 DPH, inv. nr. 329.