Welfare issues in causes of death in young pet rabbits

Research Project
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Contents

Abstract

There is a high level of mortality at a relatively young age in pet rabbits. To gain insight in the causes of premature death in pet rabbits, this study aims to give an overview of these causes of death and possibly related welfare issues. In order to do so, data from the VPDC Utrecht of necropsies on pet rabbits which died at an age of 2-36 months performed from 1993 until October 2009, were used for retrospective research. Also, data of necropsies on pet rabbits which died at an age of 2-36 months performed from October 2009 until December 31st 2011 were collected and compared to those of the retrospective research. This resulted in information on causes of death of 234 and 78 pet rabbits respectively.

Striking was that most deaths of the rabbits in this study were caused by infectious agents (71,2%). Non infectious causes and diseases with unknown etiology made up 12,8% and 16,0% of all deaths respectively. Further breakdown showed that in the retrospective research VHD, P. multocida and Eimeria spp were the most occurring causes of premature death. In the welfare project E. cuniculi, unknown cause of death and pneumonia (etiology undefined) were the most important death causes. The three most important infectious agents in the welfare project were E. cuniculi, Eimeria spp and P. multocida.

Introduction

Nowadays, many rabbits are kept as pet animals in the Netherlands. In 2005 this number was almost one million. The rabbit is the third most kept mammal pet, after the dog and cat.[1, 2]

The average age at which rabbits die is a lot lower than the average life expectancy for these animals. This life expectancy is about eight to twelve years, but the age at which rabbits die is more around four to five years. 84% of rabbits die earlier than this life expectancy of eight to twelve years.[3] This is a very high percentage.
In many cases of (premature) death, nothing is known about the cause of death.[3] Since the costs of postmortem examination are relatively high compared to the purchase of rabbits, these animals are rarely offered for necropsy.
It seems that premature deaths are often caused by inadequate circumstances concerning housing and care.[4] It appears that owners often don't know how tot take proper care of their rabbit as to feeding, housing, handling and vaccination. Many owners provide too many pellets and/or too little roughage, keep their rabbits in too small cages, handle the animals incorrectly and often don't have the animals vaccinated.[3]
When pet owners go searching for information, they will often do so through the internet. There is a large amount of information to be found, but a lot of it is contradictory, which makes it harder to learn how to take proper care of a rabbit.

In a survey for common diseases and causes of death in laboratory rabbits, mortality was highest due to gastrointestinal problems, also coccidiosis and respiratory disease seemed very important in death of young rabbits.[5] Langenecker et al explored the most common diseases in pet rabbits and concluded that tooth problems and E. cuniculi occurred the most.[6] The prevalence and type of disease in pet rabbits is different from those in laboratory animals,[6] and literature on the most common causes of death in pet animals is very limited. This makes it difficult to extrapolate literature on laboratory animals to pet rabbits.

Several diseases are common in pet rabbits, but these do not necessarily have a high mortality rate. Therefore they do not always cause a high portion of premature deaths in pet rabbits. Two diseases which do have a high mortality rate are viral hemorrhagic disease (VHD) and myxomatosis. Rabbits can be vaccinated to protect them from these diseases.
Recently, a new vaccine has become available, called Nobivac® Myxo-RHD. It claims to protect rabbits one year against myxomatosis and VHD and comes in a single dosage package. This way it is easier for owners to go to a veterinarian and have their animal(s) vaccinated throughout the year. Also, the rabbits only get 1 injection each year, which provides better welfare.[7]

Little is known about welfare of pet rabbits in general, so more knowledge about the current situation is required. To gain insight in the most important causes of premature death of pet rabbits, the Veterinary Pathology Diagnostic Centre (VPDC) of the Veterinary Medicine Faculty at Utrecht University started performing necropsies on young small pets, including rabbits, free of charge. These are part of the *three year welfare research small mammals,* started on October 1st 2009, commissioned by the Ministry of Economics, Agriculture and Innovation.

With the information provided by this research project, the main causes of death could be given more attention and thus be treated sooner or better, or even be prevented. Also, pet owners could get better and more information from the veterinarian (or breeder) about important diseases and topics like housing and vaccination. In these ways, the welfare of small mammals can be improved, and the average age at which pet rabbits die may be increased.

Materials and methods

Retrospective research, 1993-2009

When the welfare project started, the age limit of the rabbits was set at 6 to 36 months age at time of death. One year after the start of the project, the lower age limit was changed to 2 months. Retrospective research, previously done by drs. L. Banga consisted of 144 rabbits between 6 and 36 months old. Therefore, an addition to this research was necessary, in order to be able to compare this group of animals to the current welfare project.

Data were used from the archives of the VPDC Utrecht, presenting necropsy reports on rabbits from 1993 to 2009. Necropsy reports of 90 rabbits qualifying for this study were used. This included the animals that were 2 to 5 months of age at the moment of death. Furthermore, rabbits held in a laboratory or commercial setting were excluded.

Each report consisted of a history, macroscopic findings following a standard protocol (appendix 1) used by the VPDC Utrecht, and cytology of liver, spleen, lung and gut contents. When abnormalities were found during macroscopic examination, cytology was performed of these abnormalities as well. Microscopy and microbiology were performed if macroscopy and cytology had given reason to do so. The reports ended with a conclusion, giving a cause of death or an indication to the cause of death.

Welfare project, 2009-2012

78 rabbits that had died between 2 and 36 months of age were used. The rabbits were cooled directly after death and submitted to the VPDC Utrecht within 24 hours of death. Animals presented for necropsy from October 2009 until December 31st 2011 were included in this research project.

Each rabbit was accompanied by an anamnesis form (appendix 2). This form contains comprehensive information about disease, housing and feeding.

A complete necropsy was performed free of charge on each animal that applied for this study, including microscopy, and microbiology when necessary.

During the necropsy, tissues were sampled following a protocol designed for the welfare project (appendix 3).

Data analysis

All the collected data of the necropsy reports and anamnesis forms were imported in a database designed by Baijens (2008). The data from this database were exported to excel and analyzed.

Based on the necropsy reports, the causes of death were classified as infectious, non-infectious or etiology unknown.

Data from the retrospective research were compared to those of the rabbits from the welfare project.

SPSS 16 was used for statistical analysis. The chi-square test was used to assess the significance of differences in the distribution in the main groups of death causes between the retrospective research and the welfare project. The same test was used to assess the significance of differences in the distribution in the main groups of death causes between the two age groups in the retrospective research and the welfare project respectively.

Results

1. Retrospective research

The retrospective research previously done by drs. L. Banga contained 144 pet rabbits that died at an age of 6 to 36 months. 90 animals that died at an age of 2 to 5 months were added, making the total number of animals 234.

1.1 Main groups of causes of death

Death causes were divided into three main groups: infectious, non-infectious and unknown. The latter consists of cases in which the cause of death was unclear or which showed many problems, making it impossible to determine a final cause of death. All the animals were grouped into one of these three categories, this resulted in the following:

- Infectious: 72,6% (n = 170)
- Non-infectious: 12,8% (n = 30)
- Unknown: 14,5% (n = 34)

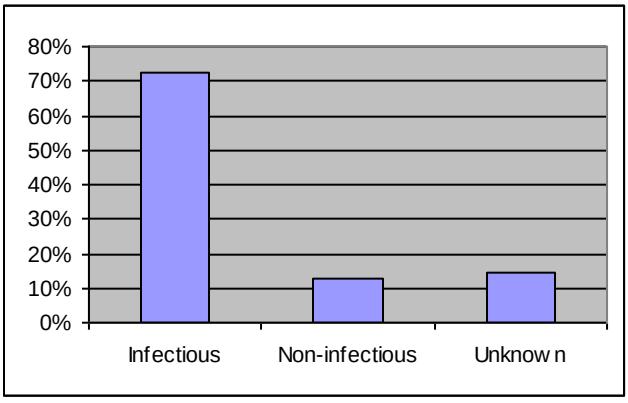

Figure 1: distribution of the main groups of death causes in the retrospective research (n = 234).

The 2 age groups of animals were compared and this gave the following results:

2-5 months (n = 90)

- Infectious: 73,3% (n = 66)
- Non-infectious: 6,7% (n = 6)
- Unknown: 20,0% (n = 18)

6-36 months (n = 144)

- Infectious: 72,2% (n = 104)
- Non-infectious: 16,7% (n = 24)
- Unknown: 11,1% (n = 16)

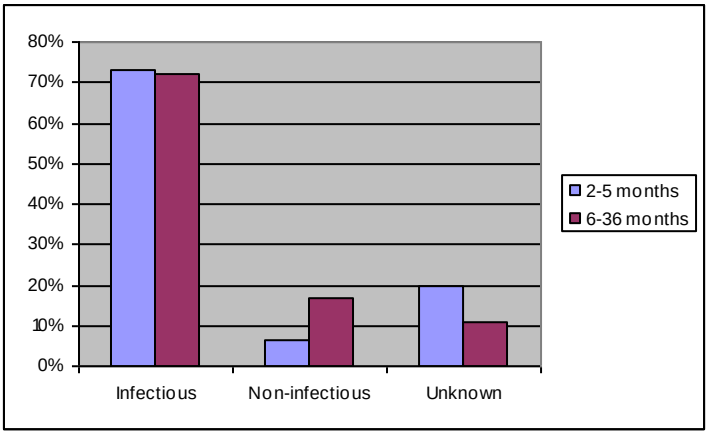

Figure 2: distribution of causes of death comparing 2 age groups; 90 animals of 2-5 months age at death and 144 animals of 6-36 months age.

The Chi-squared test showed there were no significant differences between the two age groups in the distribution of the main groups of death causes.

The three most important causes of death were all infectious agents. Together they were demonstrated in 51,3% of all 234 animals and they were the following:

1. VHD: 26,1% (n = 61)
2. Pasteurella multocida: 14,5% (n = 34)
3. Eimeria spp.: 10,7% (n = 25)

The figure below shows the share of these three agents in all deaths. In 19 animals, two infectious agents were demonstrated. In these cases, both the agents were included in the inventory.

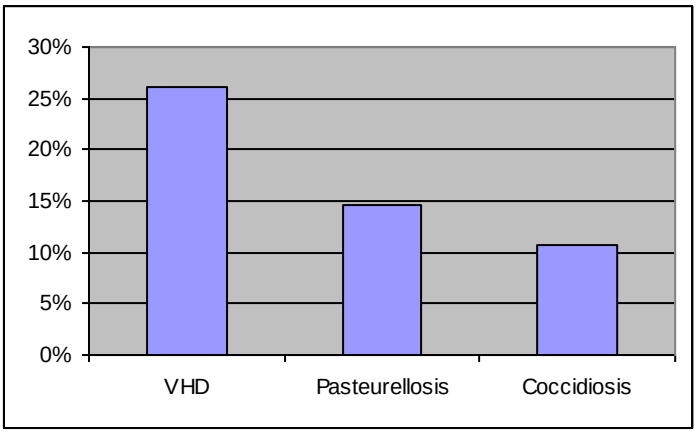

Figure 3: overview of the three most important causes of death in the retrospective research.

Within the infectious group, VHD was demonstrated in 35,9% of the animals, Pasteurella multocida in 20,0% and Eimeria spp in 14,7%.

1.2 Mostly affected organ systems

An inventory of the mostly affected organs was made. The figure below gives an overview. The lungs (n = 92), gastrointestinal system (n = 90) and the liver (n = 78) were the three organ systems affected most.

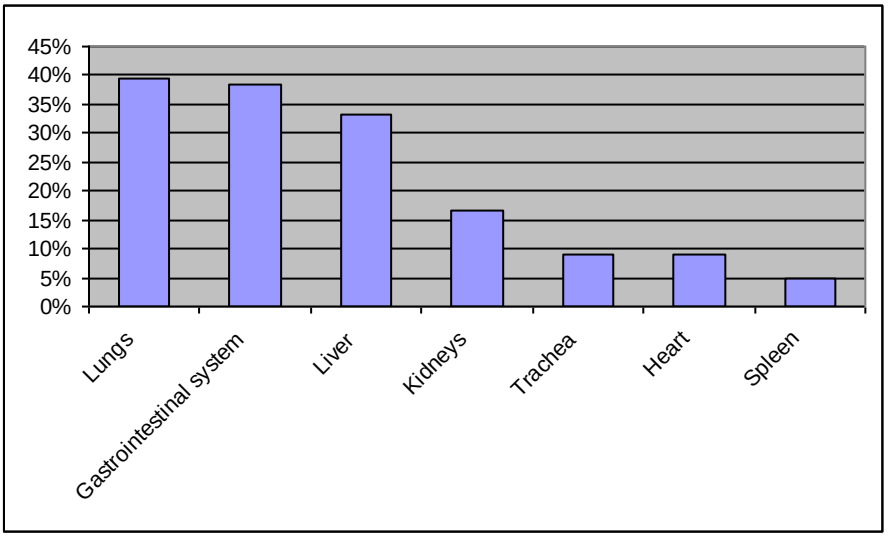

Figure 4: overview of the mostly affected organs in the animals from the retrospective research (n = 234)

1.3 Sudden death

Using the information regarding the anamnesis in the necropsy reports, an overview of sudden death was made. In 38,0% (n = 89) of the 244 cases sudden death was mentioned. In these animals, 55,1% (n = 49) of the sudden deaths can be accounted to the three most important causes of death (VHD, Pasteurellosis and coccidiosis). A further breakdown was made to identify the portion of animals that died suddenly within each of the three most important causes of death. The table below shows sudden death mortality in respect to the overall mortality within the top 3 causes of death.

Cause of death	**Number of animals died**	**Number of animals died suddenly**	**% of animals died suddenly**
VHD	61	42	68,9%
Pasteurellosis	34	13	38,2%
Coccidiosis	25	13	52,0%
Other	114	21	18,4%

1.4 Vaccination

Vaccination information was available from 57 necropsy reports of all 234 rabbits. Of these animals, 29 had been vaccinated against myxomatosis and VHD before death and 28 had not. How long before death the vaccination was administered was unknown. Of 177 of the rabbits it was unknown whether they had been vaccinated or not.

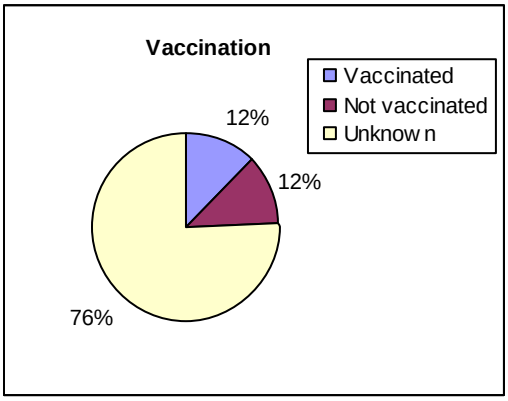

Figure 5: vaccination status of the animals in the retrospective research (n = 234).

Two of the 61 animals in which the VHD virus was demonstrated, had been vaccinated against this disease and none of the animals that died of myxomatosis (n = 3) were vaccinated against this disease.

2. Welfare project

Necropsies were performed on 78 pet rabbits. 18 of these animals were 2 to 5 months old at time of death and 60 animals were 6 to 36 months old.

2.1 Main groups of causes of death

The animals were grouped in the same three categories as was done in the retrospective research: infectious, non-infectious and etiology unknown. The distribution was as follows:

- Infectious: 66,7% (n = 52)
- Non-infectious: 12,8% (n = 10)
- Unknown: 20,5% (n = 16)

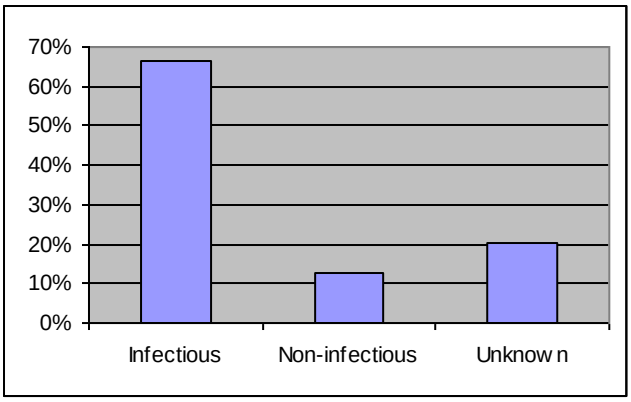

Figure 6: distribution of the main groups of death causes in the welfare project (n = 78).

In the welfare project the infectious causes also made up for the most of the deaths. The Chi-squared test showed there was no significant difference in the proportion of the main groups of death causes when comparing the retrospective research to the welfare project.

Here, the two age groups were also compared and this resulted in the following:

2-5 months (n = 18)

- Infectious: 77,8% (n = 14)
- Non-infectious: 5,6% (n = 1)
- Unknown: 16,7% (n = 3)

6-36 months (n = 60)

- Infectious: 61,7% (n = 37)
- Non-infectious: 16,7% (n = 10)
- Unknown: 21,7% (n = 13)

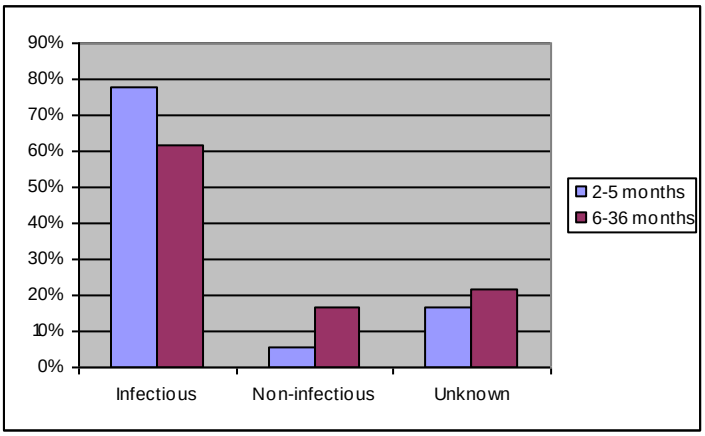

Figure 7: distribution of causes of death comparing 2 age groups; 18 animals of 2-5 months age at death and 60 animals of 6-36 months age.

The Chi-squared test showed there were no significant differences between the two age groups in the distribution of the main groups of death causes.

The top 3 of causes of death in the retrospective research consisted only of infectious agents. The top 3 death causes in the welfare project was as follows:

1. Encephalitozoon cuniculi: 24,4% (n = 19)
2. Unknown cause of death: 19,2% (n = 15)
3. Pneumonia, etiology undefined: 12,8% (n = 10)

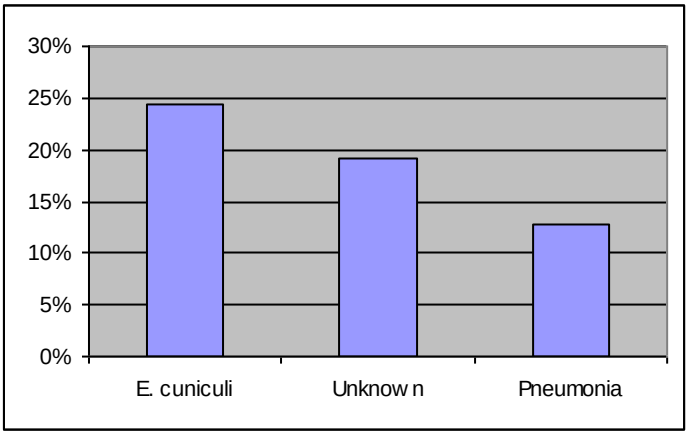

Figure 8: overview of the three most important causes of death in the welfare project.

This top 3 causes of death does not only consist of infectious agents. To be able to compare both projects, another top 3 was made. Below are the three most important infectious agents in the welfare project with their share in the infectious group of death causes. The same data from the retrospective research are repeated to give a good overview for comparison.

Welfare:

1. E. cuniculi: 36,5% (n = 19)
2. Eimeria spp: 15,4% (n = 8)
3. P. multocida: 11,5% (n = 6)

Retrospective:

1. VHD: 35,9% (n = 61)
2. P. multocida: 20,0% (n = 34)
3. Eimeria spp: 14,9% (n = 25)

In five animals, two infectious agents were demonstrated. Again, in these cases both the agents were included in the inventory.

2.2 Mostly affected organ systems

An inventory of the mostly affected organs in all animals of the welfare project was made. This showed that in the welfare project the lungs (n = 31), brain (n = 23) and gastrointestinal system (n = 21) of the animals were affected the most.
The figure below gives an overview of the organs which were affected mostly.

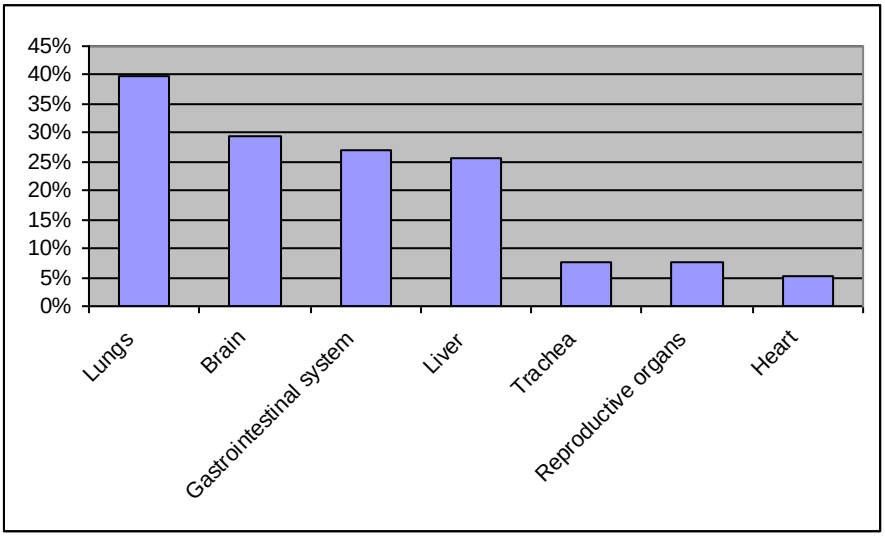

Figure 9: overview of the mostly affected organs in the animals from the welfare project (n = 78).

2.3 Sudden death

In the welfare project there was an extensive anamnesis form, on which pet owners could indicate whether their pet rabbit had died suddenly. In 33,3% (n = 26) of the cases, sudden death was mentioned. The three most important causes of death account for 46,2% (n = 12) of the sudden deaths.

Cause of death	**Number of animals died**	**Number of animals died suddenly**	**% of animals died suddenly**
E. cuniculi	19	8	42,1%
Unknown cause	15	3	20,0%
Pneumonia	10	1	10,0%
Other	34	14	41,2%

2.4 Vaccination

There was information about the vaccination status of 58 animals. 31 rabbits had been vaccinated against myxomatosis and VHD within 6 months time before death, 27 rabbits had not been recently vaccinated or hadn't been vaccinated at all during their life. Of 20 animals there was no information about whether they had been vaccinated or not. Some animals hadn't come to the veterinary practice before they got ill, so no previous information of the animal was known; it was unknown if they had been vaccinated at a different practice or not at all. Of some animals the veterinary practice did not have any information regarding vaccination of the animal in question in their records. It is likely that these animals were not vaccinated against myxomatosis or VHD, but there is no certainty so they were sorted in the unknown-group.

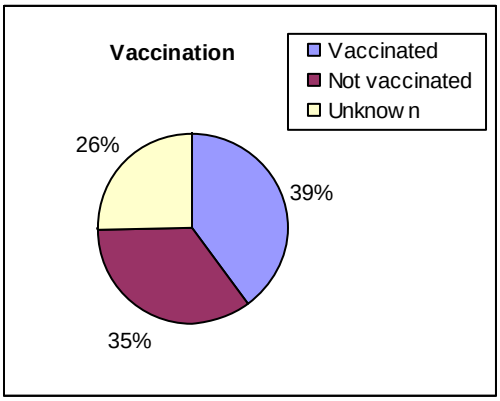

Figure 10: vaccination status of the animals in the welfare project (n = 78).

One of the animals in which the VHD virus was demonstrated, was vaccinated against the disease. Here also none of the animals that died of myxomatosis (n = 4) were vaccinated against this disease.

Discussion

1. Retrospective research versus welfare project

Infectious diseases were, and remain an important issue in pet rabbit health (figures 1 and 6). The portion of pet rabbits that died of an infectious cause does not differ significantly between the two groups of animals.
In the younger group of rabbits (2-5 months) from the welfare project, the amount of animals that died of an infectious cause seems to be a little higher than in the older animals (6-36 months). This difference is not significant though and the same difference does not appear in the retrospective research (figures 2 and 7). Therefore, it is unlikely that there is a relevant difference in causes of death between the age groups.

The three most important infectious causes of death are different in the two groups of animals. Striking was that the portion of infections with VHD changed a lot: from 26% in the retrospective research to 5% in the welfare project. Vaccination rates do not seem to differ between the groups (figures 5 and 10), but the information of many animals regarding vaccination was not available, so it was not possible to draw conclusions from these data. Furthermore, it was impossible to find out how long before death the vaccination had been administered in the retrospective research and thus if the vaccination was still effective at time of death.
The best ways to control VHD are hygienic measures and vaccination.[8, 99] It could be that animals get vaccinated more regularly nowadays than before. More research on the vaccination status of pet rabbits should be performed to be able to draw conclusions about whether the prevalence of VHD is lower due to more vaccination of the animals.

E. cuniculi seems to have become more important. It was the number one death cause in the welfare project, while in the retrospective research it was in the 6th position. It is unknown why this could be the case. E. cuniculi is not a new agent causing disease in rabbits. It seems to be known mostly as a laboratory rabbit disease. It was first described in 1922 as an infectious encephalomyelitis causing motor paralysis in young rabbits. It was named E. cuniculi in 1923, so it's a long known agent and it has been a laboratory animal problem since.[10] Laboratory rabbits are screened routinely for E. cuniculi; therefore a test is available for serological screening in pet rabbits. This gives breeders the possibility to exclude positive animals from breeding. It can be treated with corticosteroids against the inflammation reaction and fenbendazole or oxytetracycline to kill the parasite.[11,12]

Pasteurellosis and coccidiosis are the other two most important infectious diseases in pet rabbits. They were so in the retrospective research as well as in the welfare project. Pasteurella is an agent that mostly affects the respiratory tract, but it can also cause sepsis and even other problems. P. multocida can reside in the nasal cavity without causing sickness. Transmission between rabbits can occur by direct contact and by airborne spread. The disease is mostly described in laboratory rabbits and animals used for commercial purposes, but it can also cause problems in pet rabbits, mostly those housed in groups. It is difficult to demonstrate Pasteurella in nasal swabs; a PCR and serology seem more reliable to confirm pasteurellosis in a rabbit. Clinical disease can be minimized by separating recently weaned rabbits from adults, by proper housing (a clean and dry, well ventilated environment without draughts)

and preventing stress and overcrowding. The treatment of sick animals depends on the manifestation of the disease. P. multocida is sensitive to several antibiotics. [13, 1314]
Regarding Eimeria spp; it is a common parasite of the rabbit's gastrointestinal tract and liver. Many rabbits are subclinically infected with coccidia, though it can cause disease, which can be fatal especially in young rabbits.[14] Based on the necropsies performed in the welfare project and the reports of the retrospective research, Eimeria spp often seems not to be the most important problem of the animal. Mild infections are seen regularly without being the final cause of death. Wild rabbits can be affected and are a potential source of infection to pet rabbits that are fed on grass. It is treated with sulfa drugs and a well balanced diet is required because Eimeria stiedae, causing hepatic coccidiosis, interferes with vitamin metabolism.[13]

Figures 4 and 9 show that the lungs and gastrointestinal system were both much affected; in the retrospective research as well as in the welfare project. In the welfare project the brain was also affected in many rabbits. This could be due to the high portion of E. cuniculi infections in these animals.
Lung problems can be caused in many ways; several infectious agents could be possible for these problems, for example P. multocida. But also some housing systems can cause problems. Gastrointestinal problems could also be caused by infectious agents, by a misbalanced feeding pattern, by some antibiotics or other causes.
These much affected organs give some directory in possible welfare issues to be tackled. Overcrowding and improper ventilation for example can cause problems in the respiratory system. Therefore, sufficient and clear information about housing for pet rabbits should be provided to (future) pet owners, but also to pet stores and veterinarians in order to give good advice to the owners. The same goes for the gastrointestinal problems, which can be caused by misbalanced feed or infectious agents. In this case, pet owners should have access to good information about feeding and how to prevent or treat the most important diseases.

2. Limitations of this study

The aim of this study was to acquire an overview with regard to the most important causes of premature death in pet rabbits. It is difficult to say if the rabbits used in this study are representative for the whole population of pet rabbits in the Netherlands. Pet owners had to bring the animal(s) to the VPDC for necropsy themselves. Since bringing an animal costs time and fuel and this had to be done within one day, many of the animals that were offered for the welfare project came from Utrecht and its surrounding region: 46 of the 78 "welfare rabbits" were brought to the VPDC from within a radius of 40 kilometers.
There could be other reasons why rabbits aren't brought to the VPDC for necropsy. If the cause of death is obvious (eg an evident tooth problem), owners will not be curious about it and might not want to put in the effort to bring their animal to Utrecht. Furthermore, they might feel ashamed to bring such an animal, because they hadn't noticed an obvious problem or didn't have the animal treated. This could cause an extra threshold for bringing a rabbit to the VPDC.
Furthermore, if a veterinarian suspects a rabbit to have died of an infectious cause and the owner has multiple rabbits, they might be more inclined to bring the animal in for necropsy. This could be in order to be able to prevent the other animals from getting sick, or to start treatment in time, so that the remaining animals will survive.
With regards to the vaccination, often animals are only brought to the veterinary practice when they are sick. Information about the history might be missing, so it is unknown if they have been vaccinated, especially if the current owner got their pet

from someone who might have had the animal vaccinated at a different practice, or not.

Sometimes it was difficult to discriminate between pet rabbits and rabbits from rabbitries. Rabbits raised for commercial purposes are kept under different circumstances than pet rabbits and the distribution of causes of death may differ from that of the pets. This could affect the distribution of causes of death in this study. In the welfare project they were easier to exclude, since a comprehensive anamnesis questionnaire was to be filled out by the owner for every animal. Information about the number of animals in the group and sometimes general information on the owner gave some direction in this distinction. In the retrospective research less information was available, making it more difficult to discriminate between pet rabbits and rabbits held for commercial purposes.
The laboratory animals were most of the times easily identified by the name of the owner, in these cases being the name of the laboratory.

Conclusion

Infectious agents were important in causing premature death in pet rabbits in the retrospective research, but they still are important since the results of the welfare project in this match those of the retrospective research.
There has been a shift in the top 3 of most important infectious agents when comparing the retrospective research to the welfare project. Reasons for this change are unknown. Vaccination seems to be useful since the percentage of animals infected with VHD decreased a lot. However, since the information on the vaccination status of many animals is missing, it is impossible to draw conclusions from these data.
E. cuniculi seems to have become a more important agent, causing death in pet rabbits more often in the welfare project than in the retrospective research. Attention may be needed in order to prevent and treat the disease better.
Pasteurella and coccidiose keep being stress points as well, and attention is needed here also in preventing and treating these diseases.

In order to be able to prevent and treat these most important diseases and thus expand the average life expectancy, clear and unambiguous information about important rabbit diseases, proper housing and care should be easily accessible for pet owners, pet stores and veterinary practices. The pet owners will be better at making estimations about when to go to the veterinarian and how to care for their pets. Veterinarians and pet stores will be able to give good information to (future) owners.

Welfare recommendations

Even though the information about vaccination of many animals was missing, it seems that vaccinating helps to protect against myxomatosis and VHD.
Recently, a new vaccine against myxomatosis and VHD has become available, called Nobivac® Myxo-RHD.[7] Only one injection is needed each year and it claims to provide good protection against both diseases for a year. This is a positive development regarding welfare of pet rabbits. Bringing a rabbit to the veterinarian for a vaccination also gives an opportunity for a health check up and this way, problems might be noted and assessed earlier. There is little information available about this new vaccine at the moment, but the manufacturer has planned to expand this information on their website bit by bit.

Wild rabbits can introduce infectious diseases into pet rabbits or pet rabbit populations, if housed outside or fed grass from places wild rabbits have access to. Therefore, contact between pet and wild rabbits and their feces should be avoided.

When a rabbit does not feel well, it usually doesn't show this. This might be a part of the relatively high percentage of sudden death in the retrospective research as well as the welfare project. Paying regular attention to their pet, may make owners more aware of what is normal and what is abnormal behavior of their rabbit. Identifying problems early gives the rabbits a better chance of recovering from possible fatal disease.

Providing information is very important; it is the basis of all of the above. Many people will search the internet for information when they have plans to get a pet rabbit. This provides a lot of different information about what is right and what is wrong in caring for a rabbit. After that, they might go to a pet store and ask the personnel there for more information when purchasing a young rabbit.
Making sure the owners will find this information and follow the advices explained, might be hard to accomplish. An information campaign could make people aware of where to go look for information. This will cost time and money and will therefore be hard to realize, but it can reach many pet owners and other people involved, like pet store owners, breeders and veterinarians.

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Appendices

1. Standard necropsy protocol of the VPDC

Pathologienummer: Diersoort:
KLADBLOK
Gebeld met inzender (d.d., door wie, welke mededeling):
Cassette 1:
Cassette 2:
Cassette 3:
Ingevroren:
CYTOLOGIE
HC lever:
HC milt:
HC long:
HC darm:
Natief darm:

MACROSCOPIE
Sectiedatum: Path./ sio: Student:
Chip / oormerk:
Vacht / huid:
Gewicht:
Leeftijdscategorie:

Kop en hals
Neus:
Oren / ogen:
Mondholte / gebit:
Tong:
Hersenen:
(Bij)schildklieren:
Pharynx:

Thorax / respiratie & circulatie
Ligging organen / vrij vocht:
Trachea:
Pleura / diafragma:
Longen:
Hart en grote vaten:

Abdomen/ overige interne organen
Ligging organen/ vrij vocht:
Oesophagus:
Maag:
Duodenum/ pancreas:
Jejunum / ileum:
Caecum:
Colon:
Lever:
Milt:
Lnn:
Nieren:
Bijnieren:
Blaas:
Geslachtsapparaat:

Skelet/ extremiteiten
Mineralisatie:
Gewrichten:
Voetzolen:

Voorlopige conclusie na macroscopie:

2. Questionnaire anamnesis

Anamneseformulier welzijnsonderzoek konijn, cavia, fret en rat

VPDC, Postbus 80158, 3508TD UTRECHT **Tel. 030- 253 3195** Fax: 030-2534774

Praktijk: ……Relatienummer:……
Dierenarts: …… E-mail:……
Tel. Nr.: ……

Eigenaar …….. Konijn/ cavia/ fret/ rat (omcirkelen wat van toepassing is)
Straat: …… Naam/nr……
Postcode: …… Leeftijd/ Geb. datum:……
Woonplaats: …… Geslacht: M/ ex-M/ V/ ex-V
Tel. Nr.: ……
Code eigenaar: ……..

Crematie □ nee/ □ ja, naar……..
□ **Euthanasie/** □ **Gestorven** □ dd:……

Individu ziek sinds:.....
Aantal dieren in groep: .....
Aantal dieren in eenheid ziek:.....
Reeds behandeld met: ……..
Tijdsduur behandeling: ……..

Verschijnselen □ Diarrhee □ Ademhalingsproblemen □ Huidproblemen
□ Kreupelheid □ Slechte groei □ Plotseling dood
□ Slecht eten □ Slecht drinken

Huisvesting:
Lokatie: □ Binnen □ Buiten
Afmetingen: L: ..... B: ..... H: .....
Materialen: □ Hout □ Metaal □ Plastic/Fiberglas
□ Glas □ Anders.....
Bodembedekking:.....
Extra ventilatie: □ Nee □ Ja
Frequentie schoonmaken huisvesting:.....
Gebruikte schoonmaakmiddelen/desinfectia:.....

Voederfrequentie:.....
Voersamenstelling:
0 Pellets: Merk..... Hoeveelheid:.....
0 Hooi Merk..... Hoeveelheid:.....
0 Groente Soort..... Hoeveelheid:.....
0 Fruit Soort..... Hoeveelheid:.....
0 Snoepjes Merk..... Hoeveelheid:.....
0 Anders Beschrijving.....
Wat wordt hiervan gegeten?.....
Voedingssupplementen (incl. vitamine C): □ Nee □ Ja
Watervoorziening: □ kraanwater □ water uit een fles □ regenwater □ anders
Type: □ Schaaltje/kom □ Drinknippel
Frequentie verversen van water:.....

Anamnese:
.....
.....
Klinische diagnose:
.....
……

3. Necropsy protocol welfare project

Welzijnsproject kleine zoogdieren	versie 5 oktober 2009	
konijn, cavia, fret, rat		
Macroscopie	**Microscopie: in cassettes doen**	**Invriezen**
identificatie chip/ tatoeage		
gewicht		
huid, nagels	huid linkerflank	
bot (rechter femur)	rechter femurkop, **ontkalken**	
skeletspier (rugstrekker rechts)	rugstrekker links	
ogen	OS en OD	
oren, extern		
neus, larynx	conchae	
mondholte en gebit		
farynx en oesophagus	oesophagus	
(bij)schildklier	(bij)schildklier	
trachea	trachea	
long	long	long
hart	hart, circulair op 1/3 van de hoogte	hart
grote vaten		
		vet
maagdarmkanaal	maag, duodenum, jejunum, caecum, colon	colon
pancreas	pancreas	pancreas
lever en galblaas	lever, galblaas	lever
nieren en urinewegen	nieren, blaas	nieren
milt, lymfeknopen	milt, Lnn. Mesenteriales	milt
beenmerg (standaard rechter femur)	beenmerg R. femur, distaal en middiafyse	
bijnier	bijnieren	bijnieren
hersenen	hersenen	hersenen
hypofyse	hypofyse	
andere afwijkende delen	andere afwijkende delen	