



ESTONIAN UNIVERSITY OF LIFE SCIENCES
Institute of Veterinary Medicine and Animal Sciences

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**DIFFERENCES BETWEEN PET RABBIT AND FARM
RABBIT WELFARE**

**KODUKÜÜLIKUTE NING FARMIS ELAVATE
KÜÜLIKUTE HEAOLU ERINEVUS**

Final Thesis

Curriculum in Animal Science

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<p>The welfare differences between pet rabbits and farm rabbits involve various aspects of animal husbandry, such as housing, feeding, social needs and environmental conditions. Since rabbits are naturally social animals, who typically live in groups, they can experience several problems related to anxiety and stress due to loneliness in domestic settings. Anxiety and stress can lead to numerous health and behavioural issues in rabbits, such as aggression and self-harm (including pulling out their own fur).</p> <p>The aim of this study was to identify the welfare and health problems that occur most frequently in both pet rabbits and farm rabbits, as well as to find possible solutions for these issues. The results revealed that pet rabbits had a greater variety of diseases and health disorders compared to farm rabbits. The difference could be attributed to the intensive farming practices, where many farm rabbits do not live beyond 12 weeks of age, thereby avoiding age-related health issues. Pet rabbit owners also visit veterinarians for more frequent check-ups, providing early detection and more specific categorization of various diseases. This study highlights the need to improve rabbit welfare by considering their natural needs in both home and farm environments.</p>			
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<p>Koduküülikute ning farmiküülikute heaolu erinevused hõlmavad endas mitmeid erinevaid loomakasvatuse valdkondi nagu loomade elupaik, söötmine, sotsiaalsed vajadused ning keskkonna tingimused. Kuna küülikud on looduses sotsiaalsed loomad ning elavad reeglina gruppides, võib neil kodustes tingimustes tekkida üksindusest mitmeid probleeme ärevuse ning stressiga. Ärevus ning stress võivad aga tuua kaasa küülikul mitmeid terviseprobleeme ning käitumisprobleeme nagu näiteks agressiivsus, enesehävitamine.</p> <p>Läbiviidud uurimistöö eesmärk oli tuvastada peamised terviseprobleemid, mis esinevad koduküülikutel kui ka farmiküülikutel ning leida võimalikud põhjused nende tekkeks. Tulemustel selgus, et koduküülikutel on suurema variatiivsusega esinevaid haiguseid ja tervisehäireid võrreldes farmiküülikutega. Erinevuse põhjuseks, võib olla farmiküülikute intensiivne kasvatus, mille tõttu paljud küülikud ei ela üle 12 nädala vanuse, vältides seega vanadusega kaasnevaid haigused. Koduküülikute omanikud käivad samuti sagedamini veterinaaride juures ülevaatustel oma lemmikutega, seega erinevad haigused saavad tihti varajases staadiumis tuvastatud ning täpsemini kategoriseeritud. Antud uuring rõhutab vajadust küülikute heaolu parandamisele, arvestades nende loomuomaseid vajadusi nii kodu- kui ka farmikeskkonnas.</p>			
Märksõnad: loomakasvatus; söötmine; haigused; keskkond			

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GLOSSARY

Obesity – Excessive deposition of adipose tissue in the body

Chinning – Rubbing things with the underside of your chin to mark it with scent.

Binkying – The playful twisting leap that a rabbit makes, usually with a 180⁰-turn in midair.

INTRODUCTION

Animal welfare has become a highly debated topic in recent decades, with varying perspectives on what constitutes appropriate treatment of animals. Different individuals and groups portray animal welfare in distinct ways, leading to a range of opinions and practices regarding how animals should be cared for and protected. A recent study (Espinosa & Treich, 2024) shows that in Europe 91% of the people agree that protecting the welfare of farmed animals is important and also 84% believe that animals should have better protection over their welfare needs than they currently have. Despite the fact that the topic has gained a lot of traction lately, there still are not enough well-developed economic tools that would be ideal to provide sufficient understanding and information on how to improve our understanding of the topic.

To ensure the welfare of animals, a method where five different freedoms, that all animals should have, was developed. The five different freedoms are: Freedom from hunger and thirst, freedom from discomfort, freedom from pain, injury and disease, freedom and opportunity to express normal behaviour, freedom from fear and distress (Yeates, 2019). The problem with this method is, that there is a lack of information on the evaluation of the welfare and it can not be solely resolved with surveys. Public opinions in different research have helped scientists improve welfare standards and highlight the problems not taken into account on previous protocols. Other similar surveys have been done in the past, for example, “A Survey of Rabbit Handling Methods Within the United Kingdom and the Republic of Ireland” (Oxley, Ellis, McBride, & McCormick, 2018) and “Chinese Public Attitudes towards, and Knowledge of, Animal Welfare” (Carnovale, et al., 2021) covering the topics on how to hold a rabbit and the attitude towards animal care from owners.

With the rise in the general population of people who keep rabbits as their pets and raise them for production purposes (on farms), it is important to keep providing proper support and up to date information to the farmers and owners, so they can provide for the needs that the animals have. Amongst farmers and producers it is important to determine capacity

training to provide a profitable rabbit venture – and a key part of that is the health of the animals to minimize the cost of veterinary services (Paladan, 2022).

One of the goals of the survey was to gather and analyze data about different ways that owners keep their rabbits and to inform them about the results, so they could have an opportunity to improve the overall welfare and also to raise awareness amongst the general public. Some of the greatest welfare problems that owners face with their pet rabbits are inadequacy of diets and environments, not knowing the behavioural and nutritional needs of rabbits and not socializing with them in the early stages of their life (Rioja-Lang et al., 2019). Not providing enough human exposure to rabbits in the early stages of their life could cause stress in the later life when handling them (Rioja-Lang et al., 2019).

The additional purpose of the survey was to observe different health problems that farm rabbits have compared to pet rabbits, and how their quality of life could be improved by finding correlations between them and understanding where the differences come from.

1. LITERATURE REVIEW

1.1 Rabbit behaviour

Rabbits are social animals, who thrive in company with other rabbits. Naturally, they are prey animals, meaning they are meant to live in a social environment. Living together in a group enables them to communicate effectively and reduce their stress levels. Although they need socialization with other rabbits, putting multiples together in the same cage could sometimes cause harm. Pairing rabbits up with each other should be done carefully and monitored from time to time, to avoid stress behavior and aggressiveness between them. Foraging, grooming, digging, chinning, binkying and are all normal rabbit behavioural patterns that could be noticed when observing them. Thumping, fur pulling, grinding teeth, nudging and growling on the other hand could be signs of stress or anger, showing poor welfare (Medivet, 2020).

1.1.1 Rabbit population in the world

Rabbits are nowadays being raised in nearly every country, most particularly in tropical areas. In recent years China has become the largest producer, followed by Italy and South Korea (McNitt et al., 2013). The main reason for intensive rabbit production in China has been for export purposes. Even though about half of China's rabbit production is focused strictly on meat rabbits, they provide approximately 80% of the Angora wool that is being used in the textile industry (McNitt et al., 2013). This kind of intensive farming amongst rabbits often leads to "factory farming", where animals are kept in small confinements and forced into *post-partum* breeding, where the doe is rebred within 48 hours of kindling. Rabbit welfare is important to provide sustainable production on farms and to prevent proper disease control. (McNitt et al., 2013)

On the other hand pet rabbits tend to have a range of health and welfare problems that farm rabbits do not. Pet rabbits more often lack adequate socialization and when kept outside they are susceptible to predators and temperature extremes. When keeping cage-free rabbits indoors it should be carefully tracked whether they tend to chew on plants and other foreign bodies as well, to prevent toxicosis and other gastrointestinal diseases. The major nutritional problems that pet rabbits face daily are dental problems, gastroenteritis and obesity – which mainly comes from improper feeding habits from the owners (McNitt et al., 2013).

1.1.2 Rabbit population in Estonia

In Estonia, fur and meat rabbit farms are enforced by the Agriculture and Food Board to keep track of their rabbit population (Põllumajandus- ja Toiduamet, n.d.). The rabbit population data is not open to the public, but in recent years many of the formerly known farms that were active have started closing their businesses. The main reason for the decrease is the low demand for rabbit meat and the prohibition of fur farming, which will take effect starting in 2026 (MTÜ Nähtamatud Loomad, 2024).

1.2 Pet rabbits, rabbit farms and management.

Pet rabbits and rabbit farming require distinct approaches to management to ensure the well-being and health of the animals involved. Housing practices involve making cages out of locally available materials such as metal rods, tyre wire, chicken wire, flat sheets, wood, galvanized iron. When purchasing cages, the first options usually are the ones that are made out of galvanized steel, because of their longevity. Feeding practises tend to fall under the most common forages locally, for example cabbage, hay grass and sweet potato leaves – depending on the location. Health and disease management is usually controlled by maintaining cleanliness of the cages, providing vitamins with nutritious feed and by self-treating rabbits (Paladan, 2022).

1.2.1 Pet rabbits

For pet rabbits, providing a spacious enclosure is crucial, allowing them to hop, stretch, and play. The living area must be kept clean, dry, and safe from predators, with proper ventilation and stable temperature (The Hound Hub, 2018).. Enrichment is important, so supplying toys, tunnels, and chewable items helps stimulate mental and physical activity. When choosing a cage for a pet rabbit, it is recommended to go for the biggest one possible, so the living area could be divided into four different sections. The different sections should be for playing, resting, eating and drinking, toileting (Witherell, 2022).

A balanced diet is essential for pet rabbits. They should have unlimited access to fresh hay for digestive health and dental care, alongside a variety of fresh vegetables, like leafy greens. High-quality rabbit pellets should be provided in moderation and fresh, clean water must always be available. It is essential not to fill the bowl with pellets, because otherwise the rabbits might stop eating enough forage (hay or grass). Feeding quantities should be adjusted throughout their lifetime and not be the same from the start of their birth till the very end. It should be taken into consideration the age of the rabbit, their activity rate and their bodyweight. The amount of feed that they eat should also be regularly monitored. If feeding habits change, faecal pellets may start sticking to their back end or droppings stop completely, in this case it is advised to contact a veterinarian, because there is a high risk that the rabbit could be ill (RSCPA, 2022).

Regular veterinary care is necessary, including check-ups with a veterinarian, who is experienced in rabbit care. Following recommended vaccination schedules and parasite control measures, such as keeping the habitat clean daily and a balanced diet are also important. Grooming should be done occasionally , especially for long-haired breeds, to prevent matting and reduce the risk of hairballs. (Lynbrook Vet, n.d.)

1.2.2 Rabbit farms

In rabbit farming, providing adequate space for each rabbit according to farming regulations and best practices for animal welfare are essential. Appropriate bedding materials, such as soft straw should be used to maintain cleanliness and comfort, with proper airflow and a stable temperature suitable for rabbits. Proper footrest material is something that should be considered when building a living area for rabbits. Having plastic flooring instead of rough wire mesh floors could reduce the incidence of footpad problems. (EURCAW Poultry SFA, 2022)

A balanced diet tailored to the rabbits' growth stages is necessary, including high-quality hay, grains, and fresh greens. Continuous access to clean water is also necessary. In order to obtain efficient feeding, nutritional requirements should be looked at with regard to the age and stage of production of the rabbit. Many rabbit farms justify the use of only one feed for their entire colony with the fact that they are not large enough of a farm to be able to afford differential feeding options (TNAU, 2009). Providing the correct diet is a necessity to secure a healthy lifestyle for the rabbit. Nutritional deficiencies can induce infertility, muscular dystrophy, fetal and neonatal death and resorbed litters (Mayer, 2021).

Health management on rabbit farms involves regular veterinary inspections and adherence to health protocols. Biosecurity measures must be implemented to prevent disease spread and careful breeding management is needed to avoid overpopulation along with maintaining genetic health.

Welfare practices on farms should include environmental enrichment to reduce stress and promote natural behaviours, as well as ethical farming practices for humane handling and slaughter methods. Keeping detailed records of health, breeding, and production helps with monitoring the well-being of the rabbit population and ensures efficient farm management.

By adhering to these guidelines, both pet owners and rabbit farmers can ensure the health and welfare of their rabbits, promoting a humane and sustainable approach to rabbit care and management.

1.2.3 Registering rabbits

In Estonia, rabbits farms must be registered on Agricultural Registers and Information Board, to keep count of the number of rabbits that a certain farm has and also their field of work (PRIA, 2021). This is needed so the local government would be able to do routine checkups when needed, to assure proper welfare of the animals. The farmers are also able to ask for monetary support from the local government, if they keep proper track of their animals and take part in different projects, that help provide useful information towards more sustainable and more animal welfare orientated production in the future. (McNitt et al., 2013).

In America, licensed rabbit farmers must use The American Rabbit Breeders Association (ARBA) registration system. The registration requires the farmer to be a continuous member of the ARBA for at least three years and have a secured written endorsement from 20 members. Rabbits must be at least 6 months old to be inspected by a licensed registrar and they are able to receive 4 different kinds of certificates depending on how many parents and grandparents of the specific animal have been registered to the ARBA registration system previously. (American Rabbit Breeders Association, Inc., 2011)

1.2.4 Aggressive behaviour

Rabbits vary from all sorts of temperaments and breed-specific necessities. When breeding stock and trying to improve the qualities of the descendants, it is important to take into consideration the characteristics of the rabbits, to ensure easier management in the future. Often aggressive behaviour patterns from the does are transferred from the parents to their litter (McNitt et al., 2013). Aggressiveness after having a litter is normal amongst does, it indicates that the mother is alert and protective of her newborns and has a proper motherly instinct. However, if she continues to stay aggressive after a few days or weeks, culling the does should be taken into consideration, to avoid problematic behaviour in the future. Male rabbits occasionally show signs of aggression towards their companions during breeding

season. This aggression is considered hormonal and indicates the desire to ward off any rivals – could be eliminated by neutering males and spaying females (Rabbit Welfare Association & Fund, n.d.). Rabbits are often startled by loud sounds, therefore whenever entering a rabbit farm, it should be noted to try to avoid making any loud noise. On the other hand, they can recognize familiar voices and sounds, making it a good option to try and calmly talk to the rabbits, to assure them that there is nothing to be afraid of. (McNitt et al., 2013)

1.3 Different rabbit health problems

Rabbits, whether kept as pets or reared on farms, face a range of general and health-related challenges. One common issue is inadequate housing, which can lead to stress, obesity, and behavioral problems due to insufficient space. Poor sanitation in living areas also contributes to infections and respiratory issues. Nutrition is another crucial factor; a lack of balanced diet can cause malnutrition, obesity, or digestive problems, while insufficient water intake can lead to dehydration and subsequent health complications. (PDSA, 2020)

Social needs play a significant role in rabbit welfare. Isolation can result in depression or anxiety since rabbits are inherently social animals. Furthermore, a lack of mental and physical stimulation can lead to destructive behaviour and heightened stress levels. Handling rabbits improperly can cause injuries or stress, exacerbating their health issues. Out of their fear reaction, rabbits may sometimes bite. Biting does not necessarily mean that the rabbit is aggressive, but rather startled. Furthermore, a rabbit which is in pain may respond aggressively to handling attempts. (Debra, 2011)

Rabbits are prone to a range of health problems. Dental issues are prevalent, with continuously growing teeth that can become overgrown without proper wear, leading to eating difficulties and pain. Digestive problems such as GI stasis—a condition where the digestive system slows down or stops—are life-threatening and often stem from a low-fibre diet, stress, or dehydration. Diarrhoea, caused by dietary issues, infections, or parasites, is another common digestive issue. (Weir et al., 2019)

Respiratory issues, such as snuffles (pasteurellosis) and pneumonia, are frequent among rabbits, often due to bacterial infections or poor living conditions. Skin and fur problems, including mites, fleas, and sore hocks, also pose significant health risks. Reproductive health issues, such as uterine cancer in unsprayed females and reproductive tract infections in both sexes can lead to severe complications. (McClure, 2020)

Farm rabbits face additional challenges, such as overcrowding, which can cause stress, aggression, and rapid disease spread. Poor biosecurity practices often result in disease outbreaks like Myxomatosis and rabbit haemorrhagic disease (RHD) (Rosell, et al., 2019). Breeding issues, including inbreeding and reproductive exhaustion from overbreeding, further compromise rabbit health on farms (Dickie, 2011).

Preventive measures are essential for the mitigation of these problems. Regular veterinary check-ups help detect and address issues early. Proper housing with adequate space, cleanliness and ventilation, is crucial. Providing a balanced diet rich in fibre, along with fresh water, ensures nutritional health. Social interaction and mental stimulation are vital for psychological well-being, while proper handling techniques prevent injuries (McNitt, Lukefahr, Cheeke, & Patton, 2013). Responsible breeding management, as with all managed animal species, maintains genetic health and prevents overpopulation.

Addressing these general and health-related challenges through diligent care and preventive measures ensures the well-being of rabbits, whether kept as pets or raised on farms.

1.4 Importance of rabbit welfare

1.4.1 Farm rabbit welfare

There are over a billion rabbits worldwide that are kept in cages for meat production purposes (FOUR PAWS International, 2024). The cages they are kept in are often smaller than the requirements demanded, limiting their movement and natural behaviour. Cage size requirements are regulated by different laws (Animal Protection Act) and vary greatly

depending on the country or territory (Kelley & Crockett, 2012). Since rabbits are really small and sensitive, they are prone to many health and behavioural problems. The main reason for keeping rabbits in small cages and cramped up with each other is the economic efficiency for the farmers. A smaller space means lesser monetary expense. Not providing the basic necessities for a living can lead to suffering, acute pain, distress, fear and other long-term negative welfare states. (FOUR PAWS International, 2024)



Figure 1. Farm rabbits living together in a properly sized enclosure, that has enough space for them to move around, (photo, Jane Moosus).



Figure 2. Farm rabbit living alone in a pile of dung, in a small cage with dirty food and drinking bowls, (photo, Henri Neeve).

1.4.2 Pet rabbit welfare

Rabbits are one of the most recently domesticated animals and there are estimated to be around 14 million pet rabbits in the world (Kruuse, 2024). In the wild they are used to having territories, where they have free roaming space, therefore housing them in cages or small hutches can potentially harm their mental and physical well-being. Since pet rabbits are still fairly new in common households, there has not been as much research into their well-being, as there has been on other pet animals such as dogs and cats. Not knowing and providing what a pet needs might cause them to behave erratically – hissing, growling, chewing furniture, digging up ground and carpets, thumping back feet and overall aggressive behaviour. Unwanted behaviours might be caused by several reasons, which include boredom, loneliness, bad health and stress. (Kruuse, 2024)



Figure 3. A pet rabbit, who is mainly kept in a cage in the household, living amongst a cat, (photo, Jane Moosus).

2. AIMS OF THE STUDY

The aims of the study were

- To collect data about the most common welfare problems and health problems that different farms and pet rabbit owners face. Gathered information would be used to make statistics on what the most frequent underlying problems are. Methods that could be taken to try and avoid these problems will be suggested.
- To compare gathered and analyzed data with the existing information in the literature.
- To analyze different options on how to raise pet rabbits in comparison with farm and household animals.

3. MATERIALS AND METHODS

3.1 Structure of the questionnaire

The first section of the survey focused on demographic questions, to gather information about the number of rabbits owned by farms and pet owners, whether the rabbits are kept in cages or free-range and their vaccination status. These initial questions aimed to identify potential diseases or problems and understand the reasons behind them, as well as to take into consideration the socialization aspect of rabbit welfare (how many rabbits are kept more than singly). Following this, respondents answered multiple single-choice questions regarding their use of antibiotics, the frequency of veterinary visits, and any welfare problems their rabbits might have. Respondents were also given the option to specify other health issues they have encountered. In the subsequent section of the questionnaire, respondents provided detailed written answers about a range of topics, including household conditions, the owners' knowledge about rabbit care, and their future plans for improving their rabbits' well-being.

3.2 Data collection

The survey was designed by the author (an undergraduate student from the Estonian University of Life Sciences, with the help of his two supervisors).

To identify potential respondents for rabbit farms, additional research was done on the internet about local and foreign rabbit farms, learning their operational fields such as meat production, wool rabbits, breeding. Contact was made *via* email, clearly explaining the survey's purpose, the anonymous nature of it, and publication plans. For pet rabbit owners, the author used personal connections, posted in relevant Facebook groups, and sent emails to advocates who work with pet rabbits daily. Additionally, some questionnaires were administered verbally, as many countryside residents faced difficulties accessing the survey online. In total four different surveys were made for the study, in which two were designed

for farm rabbits and two were designed for pet rabbits – both in English and Estonian. The survey was carried out from the 17th of April till the 17th of May 2024.

3.3 The survey

The survey was designed to get a sense of what are the perspectives of the farmer and the pet rabbit owners about the overall health, welfare and use of antibiotics on their rabbits. The survey was made with the use of Google Docs, since it can provide a simple basis for the analyses of the gathered data and it was also simple to share with the respondents. Collected data were described and analyzed through Microsoft Excel and made into graphs with the help of a pivot table.

4. RESULTS

Out of the multiple rabbit groups with around 5000 rabbits in total and individual owners, the pet rabbit survey resulted in a total of 50 respondents. The average household out of the 50 respondents had a total of 3 (mean of 2.64) rabbits. From the 40 rabbit farms that the survey was sent out to, 10 of them participated in answering the survey. Of the 10 farms that responded, their average number of rabbits owned was just over 35 (35.4) rabbits per farm. The lack of respondents was presumably due to little interest in such projects, people not being active in the groups, farms being afraid of their anonymity and also perhaps partially due to fear of the results.

The results were initially considered separately, regarding which health problems both rabbit farms and pet rabbits have. After closer analysis and dividing different health problems into their corresponding groups, it was found, that pet rabbits had a higher range of different health problems than farm rabbits. Some of these problems might be more noticeable to pet rabbit owners, since they may spend a lot of more time individually with their rabbits than the farms. Some of the farms that the survey was sent out to, were known to the author to be “intensive rabbit farms” – where rabbits are kept for around 10-12 weeks and then slaughtered for meat (Compassion in World Farming, 2019). Due to the short life cycle of the intensive rabbits compared to pet rabbits, some of the health problems are often disregarded from farms, since it is economically cheaper for them to send the rabbits to slaughter, than to call a veterinarian and try to treat the problem.

After figuring out which health problems were the most common in households and farms, vaccinated and unvaccinated rabbits were sorted into two different groups, of pet rabbits and farm rabbits, to see if there was a difference in health problems between vaccinated and unvaccinated rabbits.

4.1 Most common health problems in pet rabbit households

One of the most common answers between vaccinated (36.1%) and unvaccinated (35.7%) pet rabbit owners was that their pets have not had any health problems so far. The main problem that both groups had, were digestive problems (42.8% in unvaccinated and 33.3% in vaccinated pets). Skin related issues were also shared evenly between the different groups (rashes, fur dropping off in certain places) – 14.3% in unvaccinated and 8.3% in vaccinated pet rabbits. An additional problem that owners reported in unvaccinated rabbits were parasites (7.1%). In vaccinated pet rabbits dental problems (8.3%), eye problems (2.8%), heart problems (2.8%), loss of appetite (2.8%), papilloma (2.8%) and respiratory problems (2.8%) were present in the case of 11 different households.

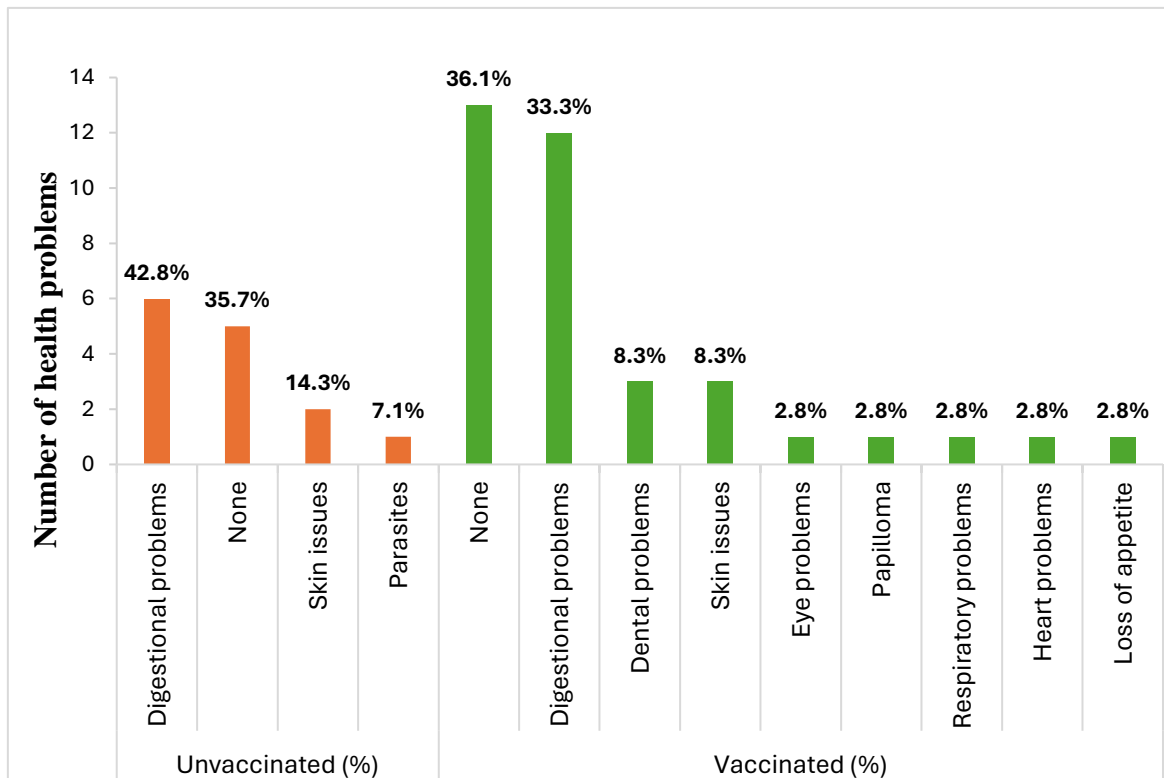


Figure 4. Health problems that unvaccinated and vaccinated pet rabbits have in 50 different households (N = 132).

4.2 Most common health problems in farm rabbits

In the case of farm rabbits, vaccinated and unvaccinated rabbits had only one similarity in their health problems, which was the presence of parasites. Parasites or dental problems were present in 50% of the unvaccinated farms, whilst vaccinated farms had a 25% occurrence of parasites as the most common health problem. The majority (50%) of the vaccinated claimed that they have not had any health problems in their farms. Two farms reported having either digestive problems (12.5%) or nest box eye (12.5%) as their most common health problems.

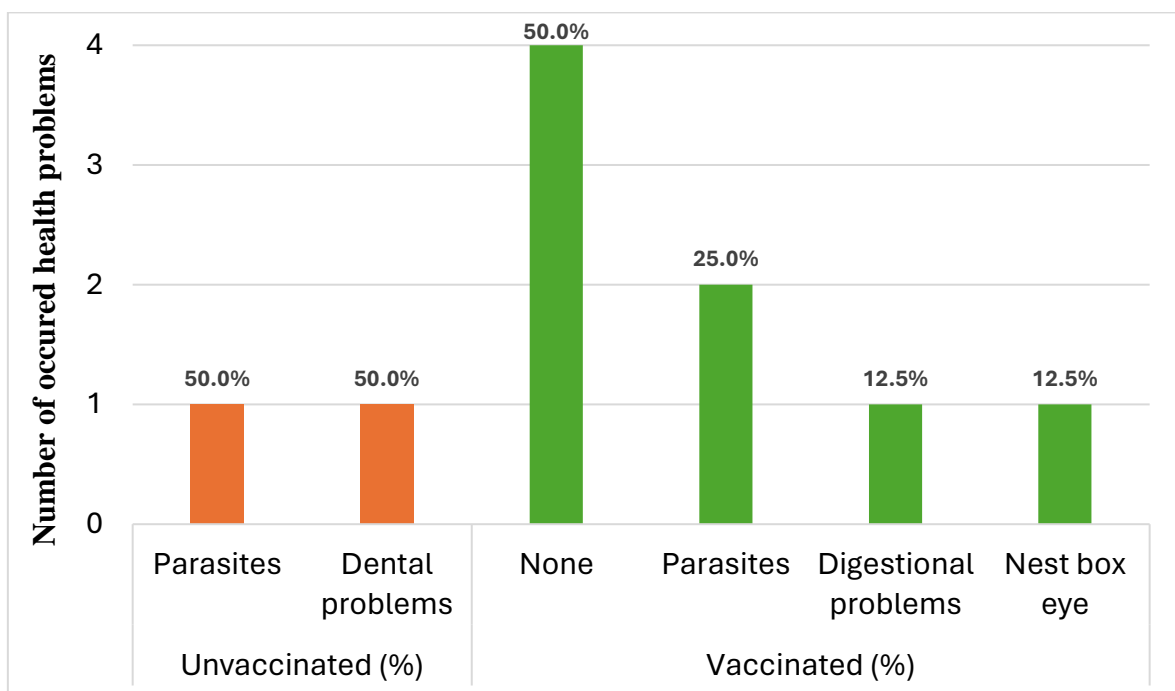


Figure 2. Health problems that unvaccinated and vaccinated farm rabbits have in 10 different farms (N = 354).

4.3 Respondents' previous knowledge

Additional questions were asked regarding the previous knowledge, on where and how respondents learned about keeping a pet rabbit. The majority of the pet rabbit owners (36%) answered “none”, as they had never learnt about the welfare or needs of a pet rabbit before

they chose to take one in or were given the rabbit by a family member. The second most common answer (34%) was that the owners read online about them (different websites and groups) and 10% of the respondents read only science articles, which they pointed out were in the English language, because there had not been much scientific research about rabbits in the Estonian language. The least popular answers (both 4% of the respondents) were that they already knew how to keep a pet rabbit from their previous experience or read online, books and science articles about them.

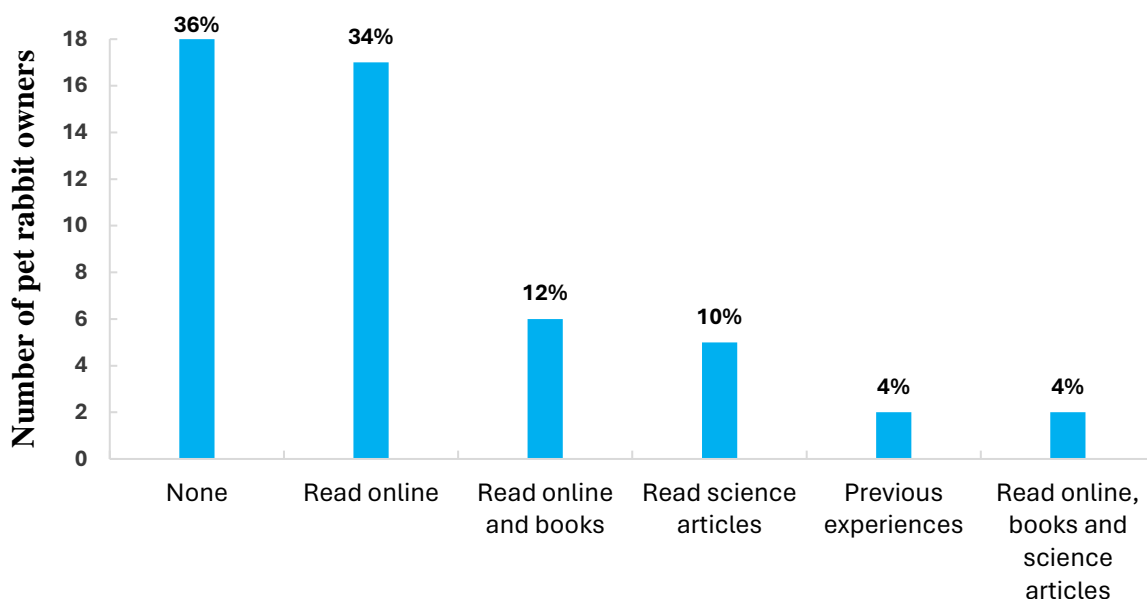


Figure 3. Previous research of the respondents about keeping pet rabbits.

4.4 Most commonly reported health problems in farm rabbits and pet rabbits

In the case of farm rabbits, 40% of the owners claimed to have had no health problems in their farms, and in the case of pet rabbit households, 36% of the owners answered the same. Parasites were claimed to be the most common health problem (30%) in farms, while they were reported in only 2% of the cases in households. The remaining health problems in farms were made up of dental problems (10%), digestive problems (10%) and nest box eye (10%). In pet rabbit households, 10% of the owners reported skin issues, 6% dental problems and

the remaining respondents had answered eye problems (2%), respiratory problems (2%), heart problems (2%), papilloma (2%) and loss of appetite (2%).

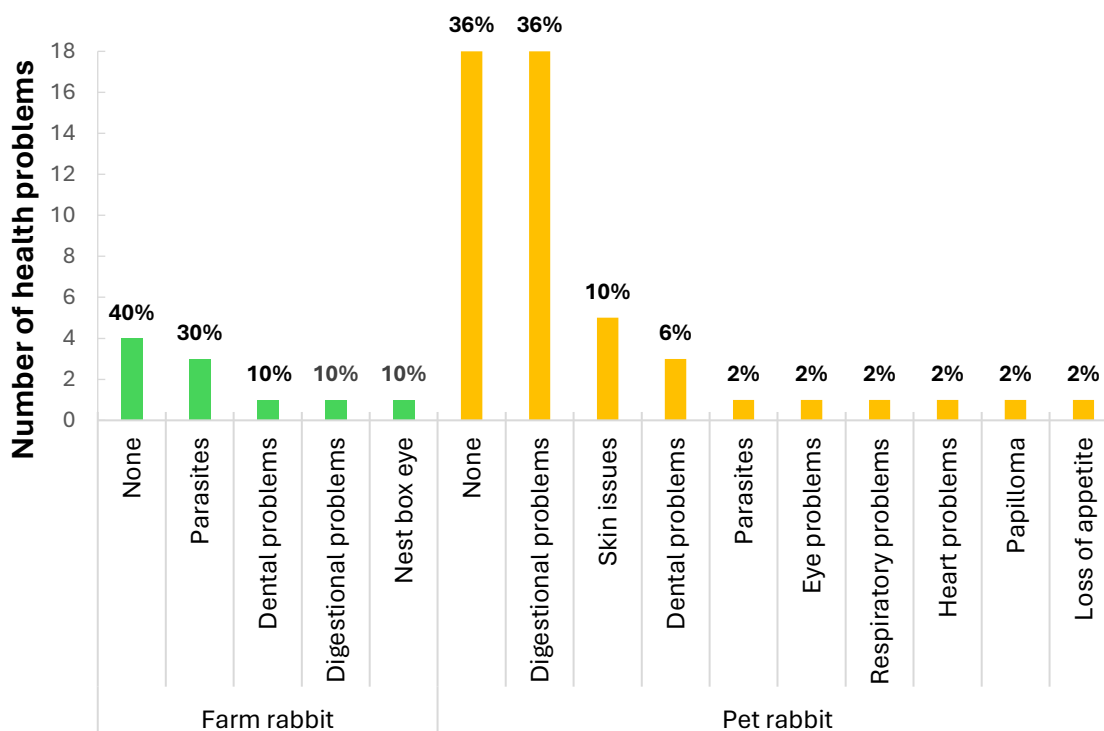


Figure 4. Difference between the most common health problems between a farm rabbit and a pet rabbit in different farms and households.

4.5 Future plans of both farm and pet rabbit owners

When asked about the future plans that the owners had set out for themselves or the welfare of their rabbits, the majority of them (46%) were worried about the size of the cage. Therefore, the main idea of the respondents was to replace their old cage with a bigger one or provide them with a nest outside, where they could be during summer. The other bigger portion (42%) of the respondents were pleased with the current situation that they were in and did not want to change anything. The rest of the respondents (12%) had plans to buy softer carpets, because of the hard wooden floors damaging their rabbits' feet, buying more toys and providing more time for their pets to go outside.

5. DISCUSSION

Since the researched groups were mostly local farmers and pet rabbit owners, a significant portion of the respondents pointed out that the lack of previous research that they had done before taking a pet rabbit was mainly because there is not as much as material about the topic in the Estonian language as they had wished for. The majority of pet rabbit owners (36%) and farmers (40%) reported that they have not had any problems with their rabbits. The reasonings behind this might be due to the fact that some of the severe pathologies might not show up in the early stages of a rabbit's life (a lot of respondents mentioned that they had just recently got their pet rabbit), not getting certain symptoms diagnosed or the lifecycle being short (on intensive farms).

Digestive problems were reported to be one of the leading problems (36%) in pet rabbit households, compared to farm rabbits (10%). The reasoning behind the difference in occurrence of digestive problems could be due to pet rabbit owners not having any previous experiences with rabbits and not knowing how to properly feed them, unlike farm owners, who work with rabbits for a living. Therefore, pet rabbit owners not knowing how to properly feed them and how to check if their pet is obese or not, is potentially one of the leading causes of digestive problems. Pet rabbits that are 10-15% above the ideal body weight (BW) are considered to be overweight, 16% and upwards are obese (UK Pet Food, 2022). Recent studies show that two in three (68%) of pet owners do not follow any guidelines when coming up with a portion size, but rely purely on their instinct (PFMA, 2014).

Another problem, that 30% of the farm owners had as the most common health problem were parasites, while pet rabbits had only in 2% of the cases. Parasites could be a cause of flies laying eggs upon rabbits, soiled bedding, an infectious newcomer in the litter or food spoilage (Heathfield Vets, n.d.). Many of the previously named factors are usually avoided in regular households, since the owners tend to have only one pet rabbit (40% of the owners in this study), where the feed spoilage is monitored more regularly, cages are cleaned daily and rabbits do not have regular contact with other rabbits. For rabbit farms to reduce the risk of parasite outbreaks in their farms, proper disinfection has to be done in the living areas of the rabbits, new litters should be held in quarantine (only 1 out of the 3 farms with parasite problems quarantined their rabbits) and more emphasis should be put on the overall cleanliness of the farm interiors.

Dental problems showed up in both cases, of pet rabbits (6%) and in farm rabbits (10%). Most commonly noted cases from the respondents were overgrown front or back teeth, which are usually caused by a diet that is too low in fibre. Feeding rabbits too many pellets will make them eat less hay, which could potentially lead to overgrown teeth and gut stasis. Because of the constant supply of hay, the high quantity of fibre in it helps their teeth wear down and prevent sharp spikes, that dig into their cheeks and tongue. (PDSA, n.d.)

One of the problems that only pet rabbits had compared to farm rabbits were skin problems. 10% of the pet rabbit households reported that their pets have had issues with their skin - fur falling out, redness, abscess, dermatitis. Skin issues could be a cause of many different problems, such as hormone imbalance, bacterial infection, parasites, improper microclimate, nest building (pulling off fur to build a nest), overgrooming by companions or fighting with them, inbreeding, stress and urinary tract disorders (Krempels, 2002). The difference between farms not reporting skin issues as their most common health problem and pet rabbit owners reporting it in 10% of households might be because of the wide definition of “skin issues”.

6. CONCLUSION

This study has explored the differences between pet rabbit and farm rabbit welfare and health problems, focusing on the critical factors that affect their quality of life in terms of their health. Through an analysis of the most common health problems that farms and different households have with their rabbits, the study concluded that the living conditions and human interactions can impact the quality of their life in many aspects, regardless of whether are kept as livestock or as pets. The most common health problems that pet rabbits have in many different households are digestive disorders, which mainly originate from false feeding habits and the inexperience of the owners from raising their rabbits. In contrast to pet rabbits, farm rabbits tend to have a problem with parasites. Parasites are a common health problem that come from poor sanitation practices, high-density living conditions in intensive farms, stress and their diet. Since intensive farms aim to get as much produce as fast as possible, the feed that the animals get is designed for rather rapid growth, than optimal health.

This research investigates the welfare implications of rabbit husbandry in different contexts and how farms could possibly consider some practices from pet owners, into their own. Some examples could be providing an adequate diet to their rabbits, depending on their different life stages (body weight, activity level, gestation period) and providing more sanitary living environments. Finally, the welfare discrepancy between both pet and farm rabbits is significant and intricate. Addressing these divergencies requires joint effort from veterinarians, farmers, pet owners and government officials, to ensure that all physical and psychological needs are met between all rabbits, regardless of their intended purpose.

7. SUMMARY

The welfare of pet rabbits and farm rabbits depends on various aspects such as microclimate, size of the living area, social needs and nutrition. Providing the necessary needs for a rabbit could be difficult, because of the variety of needs that they require in their everyday lives. When welfare needs are not met, a contrast of health problems could develop. The health problems ranged from digestive issues, parasites, dental problems, skin issues to others. From the study, it was concluded that pet rabbits suffer from a bigger spectrum of health problems than farm rabbits do. The explanation behind this could be due to the lack of knowledge that pet rabbit owners have, regarding welfare needs and more frequent visits to the veterinarian with the goal of getting different symptoms diagnosed. In order to improve the welfare of both farm and pet rabbits, which problems prevail as the most frequent ones in their separate living conditions should be considered. Afterwards, further research needs to be done on both rabbit farms and pet rabbit households, to implement the better qualities of both into their everyday lives. In order for farms to reduce the risk of some diseases such as parasites, more preventive quarantines should be done and more attention should be given to the cleanliness of the living areas. Since pet rabbit owners tend to own only one rabbit at a time, the risk of bringing in different diseases with other rabbits does not exist in most cases. On the other hand, pet rabbits might feel stress from loneliness, therefore pet owners should consider taking in another rabbit (following preventative quarantine), which could have a positive impact on the mental health of their pet. Another thing that pet rabbit owners could do, in order to reduce the frequency of digestive disorders, is to do additional research on the nutritional needs of a rabbit and feed their rabbit accordingly depending on their activity level and age.

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ÜLDKOKKUVÕTE

KODUKÜÜLIKUTE NING FARMIS ELAVATE KÜÜLIKUTE HEAOLU ERINEVUS

Loomade heaolu on viimaste kümnendike jooksul muutunud enam vaieldumatuks teemaks, kui ta on varem olnud ning loomade pidamise ning kasvatamise kohta on seetõttu tekkinud mitmeid erinevaid arvamusi. Seisukohtade erinevused on toonud kaasa endaga mitmeid arvamusi ning tavasid loomade hooldamise ja kaitse kohta. Euroopas läbi viidud uuringu põhjal selgus, et 91% inimestest peavad oluliseks, et loomade heaolu oleks tagatud ning 84% arvasid, et see võiks olla veelgi parem kui on praegu. Hoolimata sellest, et inimeste silmaring on antud teemal laienenud, vajavad heaolu probleemid siiski pidevaid uusi nutikaid lahendusi, et pidevalt areneva ühiskonna juures ei jääks loomade heaolu tagaplaanile.

Koduküülikute populaarsuse suurenemisega, on vaja garanteerida omanikele pidevalt uuenduslikke lahendusi, et tagada nende lemmikute heaolu. Peamised väljakutsed, millega omanikud igapäevaselt kokku puutuvad tulenevad ebapiisavast arusaamisest küülikute käitumisest, toitumisvajadustest ning sotsialiseerumise vajadusest. Kuna küülikud on looduses karjaloomad, eelistavad nad tihti elada rühmadena. Ühistes gruppides elamine võimaldab neil tõhusalt üksteisega suhelda ning vähendada stressitaset. Kuna uurimistöös selgus, et 40% vastajatest omavad kodus ühte küülikut, võib neil tekkida üksindusest stress, mis võib aidata kaasa erinevate terviseprobleemide tekkimisele. Uurimistööks kontakteeruti koduküüliku omanike ning farmidega nii individuaalselt kui ka läbi erinevate Facebooki gruppide. Küsitlus tehti läbi Google Forms programmi ning andmeid analüüsiti Microsoft Excel abil. Antud töös võrreldi üldiseid farmiküülikute ja koduküülikute terviseprobleemide erinevusi ning sagedusi, samuti aga vaktsineeritud ja vaktsineerimata farmi- ning koduküülikute terviserikkeid. Tulemustest selgus, et koduküülikutel on suurema variatsiooniga terviserikkeid, kui farmiküülikutel nagu näiteks südame-, hingamisteede-, isu-, silmaprobleemid ning ühel juhtumil papilloomiviirus. Farmides esines kõige sagedamini terviseprobleemidest küülikutel parasiite (30% juhtumitest), kuid koduküülikutel aga sedehyäireid (36%). Koduküülikutel ning farmiküülikute omanikel oleks tarvis omastada üksteise parimaid külgi, et minimaliseerida haiguspuhangute ning muude probleemide esinemist. Koduküülikute omanikud peaksid enne lemmiku võtmist tutvuma lähemalt söötmissvajadustega ning reguleerima seda vastavalt elujärgule, võimalusel võtma

teise küüliku, et lemmikul oleks võimalik rohkem sotsialiseeruda. Farmiküülikute omanikud peaksid rohkem tähelepanu pöörama farmide mikrokliimale ning eluasemete puhtusele, kehtestama tihedamini isolatsiooniperioode uute küülikute võtmisel (antud uuringus ainult üks farm kolmest, kellel olid parasiidiprobleemid kõige levinumad kehtestas isolatsiooniperioode).

APPENDICES

Appendix 1. Farm rabbit questionnaire

1. **Farm name (can be anonymous)**
2. **How many rabbits do you have in your farm (approximately)?**
3. **Please list three biggest welfare problems that you have with the rabbits in your farm.**
4. **Are rabbits raised cage-free or in cages in your farm?**
Cage-free
In cages
5. **Do you vaccinate rabbits in your farm?**
Yes
No
6. **Do you use antibiotics in your farm?**
Yes, but only when necessary
No
7. **What are the most common health problems in your farm?**
Skin issues
Parasites
Fleas
Tooth pathology
Loss of appetite
Digestive problems
Myxomatosis
Papilloma
Dystocia
Other:
8. **How often do you engage with a veterinarian for routine check-ups and healthcare needs?**
Daily
Weekly
Monthly
After every few months
Anually

Only when a problem occurs

9. **Do you utilize any surveillance systems or monitoring tools to track the health and behaviour of your animals? If yes, then how has it been helpful?**
10. **Do you have any future plans or goals for improving farm welfare or sustainability?**
11. **What preventive measures do you take to minimize the risk of disease outbreaks amongst your livestock?**

Appendix 2. Pet rabbit questionnaire

- 1. How many pet rabbits do you currently have at home?**
- 2. Please name a couple welfare problems (if present) what your pet rabbits have (for example stress, small cage, constant anxiety, unusual behaviour).**
- 3. Do you let your pet rabbits wander free in the house or do you usually keep them in an enclosure? (Mark only one oval)**

Let them wander free

Keep them in an enclosure

- 4. Have you vaccinated your pet rabbits?**

Yes

No

- 5. Do you constantly visit your local veterinarian with your rabbits for routine checkups?**

Yes, constantly

Only when needed

No, I do not

- 6. Which health problems have occurred the most for your rabbit/rabbits?**

Skin problems

Parasites

Fleas

Dental issues

Loss of appetite

Digestive problems

Myxomatosis

Papilloma

Dystocia (difficult/obstructed labor)

Haven't had any problems

Other:

- 7. Do you have any plans in the near future to change the living space of your pet rabbit for the better? If yes, then how?**

8. Did you read any science articles or do any kind of research to have more knowledge on how to keep a pet rabbit before taking one? If yes, what was something interesting that you found out?

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