Welfare of Growing Rabbits

Rabbits are farmed for meat in high numbers with more than 1.2 billion slaughtered in the world every year (FAOSTAT 2012). With over 340 million of these in Europe, rabbits are the second-most farmed species in the European Union (FAOSTAT 2012). However, rabbits are not protected by EU species-specific legislation. Rabbits are most commonly housed in small cages, leading to serious welfare issues due to high stocking densities, disease and injury, wire flooring and a lack of behavioural opportunity in a barren environment. Development and uptake of alternative systems has been slower than for other farmed species, however, alternative systems are beginning to grow in popularity in Northern Europe in response to public pressure. This information sheet outlines the main issues and suggests solutions to improve the welfare of farmed meat rabbits.

Housing

Space Allowance

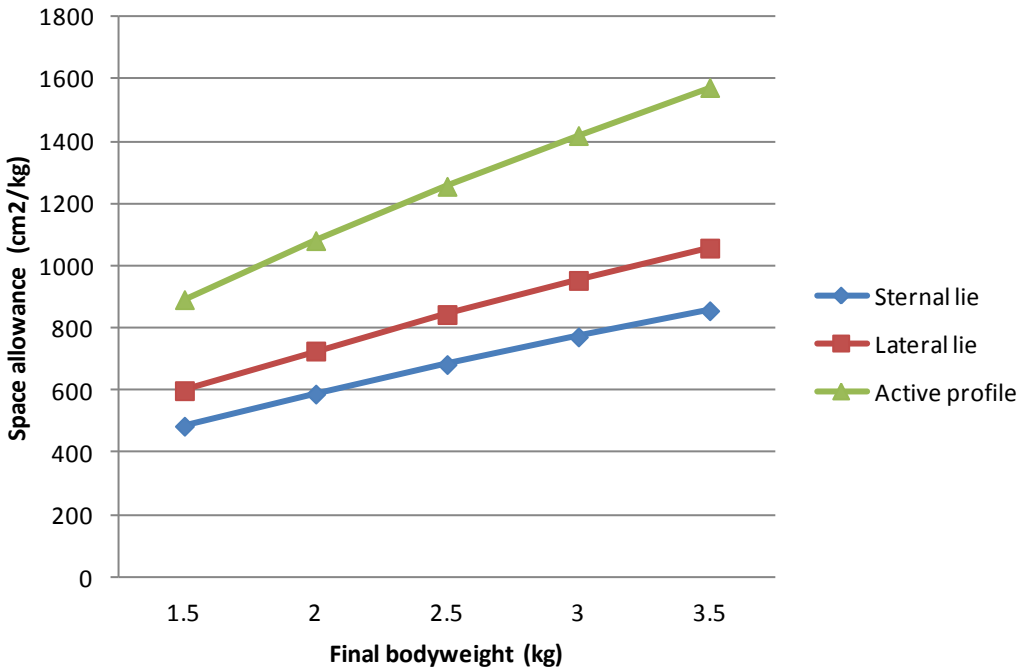
Rabbits are active animals and need sufficient space to hop, run, crawl, jump and change direction quickly (Morton *et al.* 1993, Hawkins 2008). A standard barren cage provides only around 1% of the home range of a rabbit group, which naturally covers 50m^2 (Hawkins 2008, Surridge *et al.* 1999). Insufficient exercise through a lack of space leads to weak bones and skeletal abnormalities (Martrenchar *et al.* 2001, Hawkins 2008). Rabbits housed in small cages or pens spend more time resting and less time exploring and moving than rabbits in larger floor pens (Dixon *et al.* 2010, Mirabito *et al*. 1999, Princz *et al.* 2008,). Rabbits are more active and interact with their environment more when provided with more space. When moved from a small to a larger pen, they show a rebound effect, with a significant increase in activity, demonstrating space is important to them and that space restriction jeopardizes their welfare (Dixon *et al.* 2010). By providing sufficient space, rabbits are able to maintain a similar behavioural repertoire to that in the wild (Dixon *et al.* 2010).

Barren cages are the most common system used for rabbit production in Europe, and provide each rabbit with only 450 to 600cm^2 of space. Enriched cages (or so called “welfare cages”) generally require a minimum of 600cm^2 per rabbit. Park or pen systems provide more space per rabbit, generally between 800 and 1500cm^2, depending on national legislation, weight of rabbit, and number of rabbits in the pen (see information sheet 1 for details).

The static space required for an animal is given by the allometric equation $A=kW^{0.67}$ (Petherick, 1983), where A is space in m^2/animal, W is the liveweight in kg and k is a constant which varies according to whether the animal is standing or lying. The k value for sternal and lateral recumbency with the ability to stand and feed / drink, is 0.037 and 0.0457, respectively. The latter is very similar to that calculated for animals to move between standing and lying (Petherick, 2007), but does not allow for behavioural space (general activity) or interactive space (aggressive behaviour). Extrapolation from best practice recommendations for turkeys in pole barns, with natural light and ventilation, and bedding (25kg/m^2 at 5kg, FAWC 1995), estimate a k value for animals in a more active environment, as 0.068.

Calculating the space requirement of rabbits by final bodyweight and k values for sternal lying, lateral lying and a more active profile, show that space requirements increase non linearly with increasing bodyweight, and as postural / activity demands increase, shown below.

Space requirements for animals according to final bodyweight and postural or active conditions



So for a rabbit of average slaughter weight 2.0kg, the space required for sternal and lateral recumbancy is 589 and 727cm^2, whilst for a more active profile it is estimated at 1080cm^2. Following the active curve (or above) is recommended as rabbits are active animals and therefore need more space than that afforded by providing static allowances only; the active curve is also consistent with the national recommendations outlined in Information Sheet 1.

The functional composition of space is important, as rabbits prefer to hide in small enclosed areas and use open spaces for foraging. If offered the choice, rabbits utilise different parts of their environment for feeding, nest building, resting and excretion (Hawkins 2008); therefore they need functional spaces in their pens.

Pen length and pen height are also important. The length of a pen should be sufficient to allow rabbits to perform at least three consecutive hops. A minimum pen length of 1.8m is recommended and is a legal requirement for any new park system in Belgium. There should be no height restrictions to the pen. As prey animals, rabbits spend a significant amount of time alert, scanning their surroundings by rearing up on their hind legs (McBride et al. 1986, Dixon *et al.* 2010). Cages do not usually provide enough height for rabbits to perform this vigilance behaviour, while non cage systems - such as the park or pen systems –have no height restriction and also offer different levels via platforms, for rabbits to hop on.

Flooring

Most conventional cages have wire flooring, which is uncomfortable, restricts thermoregulation and causes feet and hock injuries and pododermatitis in breeding adults (Hawkins 2008). More comfortable alternatives include plastic flooring mats which cover part of the floor area, plastic slats or solid flooring with bedding such as straw.

Environmental enrichment

Rabbits need varied, stimulating surroundings to stay occupied. Restricting natural behaviours leads to frustration, stress and stereotypies such as bar biting and over grooming (Hawkins 2008). The following resources (enrichments) should be a minimum requirement in any system.

Platforms and Hiding places: Rabbits benefit from different levels in housing, such as platforms. These are recommended to account a minimum of 25% and maximum 40% of the total space allowance and to be 25-30cm high (as per the park system), for optimum use. Different functional areas divided by partitions and hiding places – such as platforms and boxes - allow rabbits to jump onto, hide beneath or use as a lookout post, which reduces anxiety and abnormal behaviour, and improves their overall welfare (Hawkins 2008, Hansen & Berthelsen 2000). Rabbits with no chance to escape or hide are more restless than rabbits with a hiding place (Lehmann 1987 and Podberscek et al. 1991, both cited in Hansen & Berthelsen 2000). A wooden 'U' structure used for gnawing and resting can reduce faecal glucocorticioids after transport, indicating reduced stress levels (Buijs *et al.* 2011b). Specific hiding places, such as tubes, barriers or enclosed boxes, should be provided to allow rabbits to escape from aggressive individuals and to feel safe whilst resting in an enclosed space.

Hay, Straw and Gnawing Objects: Fibre (hay or straw) should be provided *ad libitum* in a rack or compressed tube (the latter is used less often as the forage is harder to access), as it is important for digestion, tooth health and to reduce abnormal behaviour, by satisfying the need to forage and chew. Hard objects provide an outlet for gnawing behaviour, whilst preventing gnawing being redirected to the cage, and help to wear down the rabbit's teeth and improve oral health (Hawkins 2008, Buijs *et al.* 2011a). Wooden blocks made of Norway spruce or Robinia increase gnawing activity better than other types of wood (Jordan *et al.* 2004). Other materials, such as carrots or additional hay and straw also allow gnawing.

Outdoor access: Whilst this is a niche production type in Europe, outdoor access offers a higher welfare potential. Outdoor access provides natural ventilation, typically more space, a choice of environment, and allows expression of foraging, exploration and vigilance behaviours, which reduces abnormal behaviour (D'agata 2009). Rabbits with outdoor access can be less fearful than rabbits housed indoors due to living in a more stimulating environment (D'agata 2009). Robust cross-breeds are better suited to variable outdoor environmental conditions, and can show better growth performance and meat quality traits, than indoor commercial hybrids (D'agata 2009). There are still welfare issues in free-range systems, especially in relation to disease and predation risks, but this can and needs to be addressed through appropriate management.

Natural light: Natural light has beneficial effects on rabbit welfare. In does, nursing behaviour is triggered by the change from light to dark at dusk (Hoy & Selzer 2002, Seitz *et al.* 1998). In fattening rabbits, light is correlated with activity (Ribikauskas *et al.* 2010). Rabbits' natural behaviour follows a diurnal pattern and they are most active in the evening, which is controlled by factors including light (Ribikauskas *et al.* 2010, Diez *et al.* 2013). The importance of natural light, and the provision of both dawn and dusk, was highlighted in the *Beter Leven* Dutch higher welfare scheme and has now also been recognised by German and Austrian legislation. Natural light can be provided through windows or solar tubes and can be supplemented with artificial lighting, ensuring 8 hours of continuous

darkness and a dawn-dusk transition. The dawn-dusk phase is recommended to be 30 minutes to two hours long, and involves dimming the lights during this period in the morning and evening before full light/darkness. This is to naturally mimic natural light changes at dawn and dusk, when rabbits are most active. Rabbits also need enclosed spaces, with lower light levels, to hide and rest.

Social contact

As social animals, individual housing causes isolation stress. Opportunities for natural positive social interaction (playing, grooming, lying together) should be provided by keeping fattening rabbits in groups with adequate space to perform such behaviours (EFSA 2005).

Health and management

Feed and water provision

Rabbits spend nearly half their time eating (Hawkins 2008), mostly in the evening and at night (Hansen & Berthelsen 2000, Ribikauskas *et al.* 2010), and feed and water should also be available *ad libitum* to prevent thirst and hunger.

Disease, Injury and Antibiotic use

Rabbits are highly susceptible to respiratory and enteric disease and mortality rates can reach 30%. In France it was recorded that 5 and 7 times more antibiotics were used for rabbits in 2012 than pigs and poultry respectively (SVMV 2010). High prophylactic antibiotic use can lead to bacterial resistance and indicates the animals are in unsuitable or unhygienic housing, relying on antibiotics to keep them alive. Hygienic housing and air quality through good ventilation are crucial, preventing the need for routine antibiotics. Coccidiosis can be reduced by ensuring there is minimal faeces build-up in housing and by using a Coccidiostat (non-antibiotic drug). Pasturellosis can be controlled through strict hygiene and ventilation; however its aetiology is not fully understood. For more information on antibiotics, see: http://www.ciwf.org.uk/media/3758860/Case-Study-of-a-Health-Crisis-A-report-for-the-Alliance-to-Save-Our-Antibiotics.pdf

Stockmanship

Gentle, frequent handling of rabbits at a young age reduces fear of humans as the animals mature and can improve growth rate and reduce mortality (Jezierski *et al.* 1996, Hawkins 2008). Regular inspections are important to check on the health of the animals.

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Table 1. Summary of typical provisions in different rabbit housing systems

Type of System / **Resource provided**		**Cage** (barren) 	**Cage** (enriched) 	**Indoor Pen** (park, barn) 	**Free-range** 
Feed and water *ad libitum*		✔	✔	✔	✔
Natural light		In outdoor cages	In outdoor cages	Occasionally	✔
Non-wire flooring		-	Partial	✔	✔
Bedding		-	-	Occasionally	In winter
Higher space allowance		-	-	✔	✔
Group housing		-	✔	✔	✔
Enrichment	Platforms	-	✔	✔	-
	Hay/straw fibre	-	Occasionally	✔	✔
	Hiding places	-	-	✔	Occasionally
	Gnawing object	-	✔	✔	✔
Low typical mortality (<10%)		-	✔	✔	-
Freedom to express behaviour	Hop	-	One	Three	✔
	Rear on hind legs	-	✔	✔	✔
	Jump	-	✔	✔	✔
	Lie stretched	-	-	✔	✔
	Dig	-	-	-	✔
	Hide	-	-	✔	✔
	Escape others	-	-	Dependent on design	✔
	Access outdoors	-	-	-	✔