G. Species-specific provisions for farm animals and mini-pigs

a. General considerations

1. Introduction

For the purposes of this document the term “farm animals” includes cattle, sheep, goats, pigs, mini-pigs and equines, including horses, ponies, donkeys and mules.

The use of farm animals in research varies from applied experiments under farm conditions to more fundamental studies in agricultural, veterinary or biomedical research carried out under laboratory conditions. In the former case, it is important that the housing and management conditions, whilst taking due account of animal health and welfare, produce information which can be reliably applied to commercial farm conditions. In the latter case, where more invasive procedures are frequently involved, a different type of housing and management is necessary. The precise nature of the housing adopted should be suitable to yield information of relevance to the experimental question and appropriate for the procedures involved.

Management systems for all farm animals should accommodate their natural behaviour, in particular the need to graze or forage, exercise and socialise.

Farm animals are held in a number of different types of enclosure, often dependent on experimental requirements. For example, farm animals may be held on pasture, in open-sided buildings with access to open yards, in enclosed buildings with natural ventilation or in specialised buildings for quarantine and biocontainment with natural or forced ventilation.

During agricultural research, when the aim of the research requires that the animals are kept under similar conditions to those under which commercial farm animals are kept, the keeping of the animals should at least conform with the standards laid down in the European Convention for the Protection of Animals kept for Farming Purposes (ETS No. 87) and in relevant national recommendations and guidelines.
2. The environment and its control

Under natural conditions farm animals are exposed to, and will tolerate, a wide range of temperatures, although there is some variation in the degree of tolerance between species and breeds. They will seek shelter against driving rain and strong wind, and protection from intense sun. Where they are kept in enclosures exposed to outdoor conditions, shelter and shade and a reasonably dry lying area should be provided. Shelters should be carefully positioned taking these factors into consideration. Sufficient shelter should be provided to protect all animals from adverse climatic conditions.

Animals held outdoors or in buildings with natural ventilation will be exposed to ambient environmental conditions. Animals should not be restricted to such areas under climatic conditions which may cause the animals distress.

Environmental parameters, in particular temperature and humidity, are strictly interrelated and should not be considered in isolation.

2.1. Ventilation

All farm animals are sensitive to respiratory problems. In the absence of mechanical ventilation, as is the case in a significant number of farm animal buildings, it is important to ensure that suitable air quality is provided by natural ventilation (see paragraph 2.1.1. of the General section). Ventilation systems should be designed to avoid or at least minimise drafts.

Dust levels in the air from feed and bedding should be minimised.

2.2. Temperature

The thermoneutral zones of farm species vary considerably, depending on the conditions to which the animals are acclimatised. Farm animals living outdoors can, given time, develop a thick layer of hair/wool during the winter months to help them to tolerate low temperatures. They may acclimatise to lower temperatures indoors even without the growth of winter coats, provided
the relative humidity is low, draughts are avoided and they have a lying area
with sufficient dry bedding material. In indoor enclosures it is therefore
important to avoid wide fluctuations and sudden changes in temperature,
particularly when moving animals between indoor and outdoor
accommodation. As farm animals may suffer from heat stress, during periods
of high temperature it is important to ensure that appropriate measures, for
either the shearing of sheep and provision of shaded lying areas, are in
place to avoid welfare problems if forced ventilation or fans are not available
or not adequate.

Appropriate temperature ranges are dependent on a number of factors
including, for example, breed, age, caloric intake, weight, stage of lactation
and type of environment.

2.3. Humidity
Under natural conditions, farm animals are exposed to, and tolerate well, a
wide range of relative humidities. In controlled environments extremes and
sudden wide fluctuations of humidity should be avoided, as both high and low
humidity can predispose animals to disease (e.g. respiratory disease).

In indoor enclosures, buildings should be designed with sufficient ventilation to
prevent prolonged periods of high humidity, as this may cause excessive
dampness in the animal enclosures, predisposing the animals to diseases
such as respiratory disease, foot-rot and other infectious conditions.

2.4. Lighting
Farm species have evolved to live in different conditions; for example
ruminants graze and rest during daylight in open grassland, whereas pigs
show crepuscular activity in woodland areas. Provision of adequate light is
important for all farm animal species, and natural light is preferred where
possible. Where this is not provided, the light part of the photoperiod should
be within a range of eight to twelve hours daily, or should reproduce natural
light cycles. A controlled photoperiod may be needed for breeding and for
some experimental procedures. Sufficient natural or artificial light should also be available for inspection of groups and individuals.

Where windows are provided, breakable glass should be screened using a protective physical barrier or be situated out of reach of the animals.

2.5. Noise

Unavoidable background noise from, for example, ventilation equipment, should be minimised, and sudden noises should be avoided. Handling and restraint facilities should be designed and operated to minimise noise during use.

2.6. Alarm systems

(See paragraph 2.6. of the General section)

3. Health

3.1. Disease control

As farm animals are often sourced from commercial farms, it is important that measures are taken to ensure that animals of a suitable health status are obtained. Mixing animals from different sources is a particular risk.

Preventive medicine programmes should be developed on the basis of veterinary advice for all farm species, and appropriate vaccination regimes adopted as necessary.

Foot care management, parasite control measures and nutritional management are essential parts of all farm-animal health programmes. Regular dental examinations and respiratory disease preventive measures are of particular importance in equine programmes.

Regular review of production indices and condition scoring should also be included. Care is needed to ensure that any substrate provided does not introduce or promote growth of infectious agents or parasites.
3.2. Behavioural abnormalities

Behavioural abnormalities such as tail, ear or flank chewing or biting, wool pulling, navel sucking, weaving and crib biting can occur as a consequence of poor husbandry or environmental conditions, social isolation, or from boredom due to long periods of inactivity. If such abnormalities occur, measures should be taken immediately to rectify these deficiencies including, for example, a review of environmental factors and management practices.

3.3. Husbandry

Disbudding, dehorning of adult animals, castration and tail docking should not be done unless justified on welfare or veterinary grounds. When such techniques are carried out, appropriate veterinary advice and anaesthesia and analgesia should be provided.

3.4. Neonatal care

High standards of stockmanship and care are necessary for successful rearing of farm animals during the neonatal period.

Suitable accommodation, with a dry clean area, should be provided for peri-parturient and neonatal animals. Facilities should be designed to facilitate observation and be maintained to high hygiene standards, as young animals are particularly susceptible to infections.

All neonates should receive adequate amounts of colostrum as soon as possible after birth, and preferably within four hours. Adequate supplies of colostrum should be available for use in emergencies.

Suitable feeding practices should be in place to allow normal growth and development, with access to roughage provided to ruminants from two weeks of age.

As neonatal animals have poor thermo-regulatory control, particular care is needed to ensure that suitable temperatures are provided and maintained. A
supplementary local heat source may be required, although care is needed to avoid the risk of injury, such as burns, and accidental fires.

To reduce the risk of mis-mothering or rejection, it is important that a strong maternal bond is allowed to develop during the first few days of life. During this period it is important to minimise handling or management procedures, such as transport, castration or tagging that may disrupt this relationship or prevent the young animals accessing sufficient amounts of colostrum or milk.

Weaning strategies should be given due consideration to minimise stress in the mother and offspring. Weaning into groups of animals of similar ages facilitates the development of compatible and stable social structures.

Naturally reared pigs and mini-pigs should not be weaned before four weeks of age, lambs, kids and beef calves before six weeks of age and equines before twenty weeks of age, unless there is justification on veterinary or welfare grounds.

For animals which are artificially reared, commonly dairy calves or lambs, appropriate feeding regimes should be provided to satisfy nutritional requirements, and in the case of ruminants, to promote normal rumen development.

Early weaning from the dam on experimental or veterinary grounds should be determined in consultation with the animal technician and with the competent person charged with advisory duties in relation to the well-being of the animals. In such circumstances, additional attention and means should be targeted to the welfare and care of these animals.

4. Housing, enrichment and care

4.1. Housing

Farm animals should be housed in socially harmonious groups within the animal enclosure, and husbandry practices designed to minimise social
disruption, unless the scientific procedures or welfare requirements make this
impossible.

When kept in groups, a defined hierarchy is quickly established. Some
aggressive interaction may be encountered during initial grouping while
relative rankings in the social hierarchy are established.

Special care is needed to minimise aggression and potential injury when
grouping, regrouping, or introducing an unfamiliar animal to a group. In all
cases, animals should be grouped according to size and age and monitored
for social compatibility on an ongoing basis.

Separation from a group and the single-housing of farm animals for even short
periods can be a significant stress factor. Therefore, farm animals should not
be single-housed unless justified on welfare or veterinary grounds. The
exceptions, where animals may prefer to be housed singly include females
about to give birth, and adult boars, which can be solitary under natural
conditions.

Single-housing, justified on experimental grounds, should be determined in
consultation with the animal technician and with the competent person
charged with advisory duties in relation to the well-being of the animals.
Factors to be taken into consideration should include the nature of the
individual animals, their likely reaction to separation from the group and the
need for and duration of an habituation period. Where individual housing is
necessary, animals should have visual, auditory and olfactory contact with
conspecifics.

4.2. Enrichment
As a stimulating environment is an important contributing factor to farm animal
welfare, environmental enrichment should be provided to prevent boredom and
stereotypic behaviour. All farm animal species naturally spend a large amount
of time each day grazing, browsing or rooting for food, and in social
interaction. Suitable opportunities should be provided to meet these
behaviours, by for example access to pasture, the provision of hay or straw or manipulable objects such as chains or balls.

Enrichment materials and devices should be changed at regular intervals since animals, in particular pigs, tend to lose interest in materials to which they have become accustomed. Sufficient enrichment devices should be provided to minimise aggressive behaviour.

4.3. Enclosures – dimensions and flooring

Appropriate design of farm-animal enclosures is essential to ensure that suitable space is available within the enclosure to allow the animals to carry out a range of normal behaviour. Floor type, drainage, provision of bedding (and hence ease of maintaining hygiene) and the social circumstances (group size and stability) will all impact on the space requirements for the animals.

All enclosures should be designed and maintained to ensure that animals cannot be trapped or injured, for example in partitions or under feed troughs.

Animals should not be tethered, unless justified on scientific or veterinary grounds, in which case this should be for the minimum time period necessary.

Sufficient space should be provided for each animal to stand up, lie comfortably, stretch and groom themselves, with access to a communal lying area and adequate room for feeding.

The lying area should allow all animals to lie in lateral recumbence simultaneously, bearing in mind that whilst some farm animals, for example pigs, generally prefer to lie in physical contact with other conspecifics, others, such as equines prefer a degree of spatial separation. Under conditions of high temperatures, where animals need to lie with complete spatial separation to facilitate heat loss, a greater lying area should be allowed.

The lying area should be provided with bedding to enhance comfort and reduce the incidence of pressure lesions. Where absence of bedding is
necessary for experimental reasons, the floor should be designed and insulated to improve physical and, unless a suitable controlled environment is provided, thermal comfort.

The height of enclosures should allow natural rearing and mounting behaviour.

Enclosure flooring materials should be non-injurious and provide adequate grip for unconstrained locomotion and posture change. Floors should be well maintained and replaced when necessary, as surface damage will cause injuries to develop over time.

4.4. Feeding

The diet should provide adequate nutrients to support the maintenance energy requirements of each animal, given the environmental conditions under which animals are kept. Additional energy will be needed to support pregnancy, lactation and growth, and should be tailored to the needs of the animals (for example, high genetic merit dairy cattle). Vitamin and mineral levels in the diet should also be considered, for example to avoid copper toxicity in sheep or the formation of urinary calculi in male castrated sheep, and where necessary, mineral licks should be provided.

When grazed grass is used as forage, stocking densities should be controlled to ensure adequate supplies are available to meet the nutritional requirements of all the animals. Where grass supply is limited, provision of additional feed in the field should be considered.

For ruminants and horses, sudden changes in diet should be avoided, and new items introduced gradually, especially where high-energy feeds are introduced, or during periods of high metabolic demand, for example around parturition. Sufficient roughage should be provided.

In group-housing systems, there should be sufficient food provided in sufficient numbers of sites for all individuals to access without risk of injury.
Forage forms a significant component of the diets of farm animals. Since the amount of forage needed may preclude the use of bags for storage, forage items, including hay, straw, silage and root crops, should be stored in a way that minimises deterioration in quality and the risk of contamination. A pest-control strategy should be in place in areas where forage and concentrates are stored.

When grass is cut for feeding housed animals (for example, zero-grazing), it should be done frequently, as cut grass heats up when stored and becomes unpalatable.

4.5. Watering
Animals should have access at all times to fresh uncontaminated water, which should be readily accessible to all individuals within the social group. The number of drinking points or trough length should be sufficient to allow access to water for all individuals within the social group. Flow rates should meet the demands of the individual animal as these will vary depending on the feed, physiological status and ambient temperature, for example, lactating animals have much higher water demands than stock animals.

4.6. Substrate, litter, bedding and nesting material
(See paragraph 4.8. of the General section)

4.7. Cleaning
(See paragraph 4.9. of the General section)

4.8. Handling
If handling and restraint facilities are required, these should be of robust construction and safe for animals and operators. In particular, a non-slip floor should be provided.

Handling and restraint facilities can take the form of basic equipment provided within the animal enclosure, or more complex, dedicated facilities serving the
needs of the whole establishment. Handling and restraint facilities can be provided in the enclosure area, but care should be taken to ensure that these do not compromise space allowances or create a potentially hazardous physical obstruction in the enclosure.

The dedicated facilities should, where possible, incorporate races and pens for separating animals; footbaths; special facilities for some species such as plunge dip baths and shearing pens for sheep; and an area to allow animals to recover after treatments. Ideally these facilities should be protected from prevailing weather conditions for the comfort of both animals and operators.

Animals should be handled quietly and firmly and not be rushed along races and passageways. These should be designed, taking account of the natural behaviour of the animals, to facilitate ease of movement and minimise the risk of injury. Immobilisation devices should not cause injury or unnecessary distress. Aversive stimuli, physical or electrical, should not be used.

Passages and gates should be of sufficient width to permit two animals to pass freely, whereas races should be only wide enough to permit one-way movement.

Regular handling will allow habituation of animals to human contact. Where frequent handling is required, a programme of training and positive rewards should be considered to minimise fear and distress.

Animals should not be closely confined except for the duration of any examination, treatment or sampling, whilst accommodation is being cleaned, milking, or loading for transport.

4.9. Humane killing

All systems for the humane killing of farm animals should be designed to ensure that animals are not caused unnecessary distress. Careful handling by experience staff, with minimum disruption to normal practices, will minimise distress to the animals, before they are humanely killed.
Killing should not be performed in areas where other animals are present, unless in the case of euthanasia of a badly injured animal where additional suffering may be caused by moving the animal and it is not otherwise possible to separate the animal.

4.10. Records
(See paragraph 4.12. of the General section)

4.11. Identification
Animals should be individually identified by the appropriate use of transponders, ear tags, plastic neck collars and/or rumen boluses. Freeze branding and tattooing may be less suitable. Hot branding should not be used.

Identification devices should only be applied by trained personnel and at times when the procedure is likely to have minimal adverse effects on the animal. Tagged or tattooed ears should be checked regularly for signs of infection and lost tags should be replaced using the original tag hole where possible.

If electronic identification devices are used, they should be of the correct size and specification for the animal and should be checked regularly for function and the absence of any adverse reactions, for example, injection site reactions and rubbing or pharyngeal trauma as a result of improper bolus administration.
b. Additional provisions for housing and care of cattle

1. Introduction

Cattle (Bos taurus and Bos indicus) are social animals forming hierarchies based on dominance relationships among herd members. They will frequently develop affinity relationships with conspecifics. As ruminants, cattle spend much of the day foraging, followed by long rest periods. Cattle are normally docile and are easily habituated to human contact.

2. The environment and its control
(See paragraph 2 of the General considerations for farm animals and mini-pigs)

3. Health
(See paragraph 3 of the General considerations for farm animals and mini-pigs)

4. Housing, enrichment and care

4.1. Housing
Horned and polled animals should not be mixed, except for young calves and their mothers. Where horned cattle are housed together in groups, more space will be required. Pens should be rectangular not square. The width of the pen should be no less than the length of the animal from the nose to the root of the tail.
4.2. Enclosures – dimensions and flooring

Table G.1. Cattle: Minimum enclosure dimensions and space allowances

<table>
<thead>
<tr>
<th>Body weight (kg)</th>
<th>Minimum enclosure size (m²)</th>
<th>Minimum floor area/animal (m²/animal)</th>
<th>Trough space for ad-libitum feeding of polled cattle (m/animal)</th>
<th>Trough space for restricted feeding of polled cattle (m/animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 100</td>
<td>2.50</td>
<td>2.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>over 100 to 200</td>
<td>4.25</td>
<td>3.40</td>
<td></td>
<td></td>
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<tr>
<td>over 200 to 400</td>
<td>6.00</td>
<td>4.80</td>
<td></td>
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<tr>
<td>over 400 to 600</td>
<td>9.00</td>
<td>7.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>over 600 to 800</td>
<td>11.00</td>
<td>8.75</td>
<td></td>
<td></td>
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<tr>
<td>over 800</td>
<td>16.00</td>
<td>10.00</td>
<td></td>
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</tbody>
</table>

Where cattle are housed indoors, a bedded area sufficient to allow all of the animals to lie simultaneously will be provided. Where cubicles are not provided, this area will normally be approximately 70% of the minimum floor area shown in the above table. The remainder of the enclosure can be non-bedded for feeding and exercise.

If individual open-ended cubicles are provided as the bedded area, this area may be reduced in size, but the total number of cubicles should exceed animal numbers by 5% to reduce competition and permit all animals to lie simultaneously. The design of cubicles is critical to their comfort, and should include consideration of the body size of the animal, a surface sufficiently cushioned to prevent injury, adequate stall drainage, correctly positioned stall dividers and head rails, lateral and vertical freedom for head movement and adequate lunging space. The height of the rear step should prevent dung entering the cubicle during cleaning, but not be of such a height that it causes damage to the feet during entry and exit. The remainder of the enclosure can be non-bedded for feeding and exercise.

Cubicle length is primarily determined by the weight of the animals. Cubicle width will vary, depending on the type of division used, but must be sufficient
to allow the animals to lie comfortably without undue pressure being exerted
by the divisions on vulnerable parts of the body. Specialist advice should be
sought on the design and installation of cubicles.

4.3. Feeding
The trough space provided must be sufficient to allow all animals to feed at
the same time, unless the diet is available *ad libitum* (see above table).
Horned cattle require more trough space than polled animals, and allowance
should be made for this.

4.4. Watering
Water troughs: there should be sufficient linear trough space to allow 10% of
the animals to drink at one time. This equates to a minimum of 0.3 metres per
10 adult cattle. Lactating dairy cows will require 50% more space.
Water bowls: a minimum of two water bowls should be provided when cattle
are group-housed. For groups of over twenty cattle, at least one drinking bowl
for ten animals should be provided.

4.5. Handling
Where animals are milked by machine, equipment should be maintained to a
high standard to prevent diseases such as mastitis.
Horned cattle may present a danger to personnel in confined spaces. Under
these circumstances, it may be necessary to consider dehorning. Wherever
possible, this should be carried out on calves under the age of eight weeks.
c. Additional provisions for housing and care of sheep and goats

1. Introduction

Sheep (Ovis aries) are grazing animals which, because of breed differences, for example fleece characteristics, will thrive in a wide range of climatic conditions.

Under natural or farming conditions, sheep are very social, spending all their lives close to other members of the flock whom they recognise individually. As a species, they are therefore particularly disturbed by social isolation, a factor which should be taken into account when designing animal accommodation. However, in terms of social cohesion there are recognisable variations between breeds as, for example, hill sheep tend not to flock closely together when left undisturbed.

Goats (Capra hircus) are a naturally inquisitive species and generally interact well with other animal species and humans. Like sheep, goats live in social groups and are disturbed by social isolation. Goats obtain their food by browsing more than by grazing and are best adapted to dry, firm ground. Their ability to climb is considerable and this facilitates their browsing. They prefer warm conditions and do not tolerate wet and windy conditions well.

2. The environment and its control

Under extreme conditions, sheep will require access to natural or artificial wind-break shelter and shade, whilst different coat characteristics mean that goats are less tolerant of prolonged rain and should have free access to roofed shelter areas whilst outside.

Recently shorn animals may need higher environmental temperatures than fleeced animals.
3. Health

Adult sheep and goats of wool breeds should be shorn at least once per year, unless this would compromise their welfare.

4. Housing, enrichment and care

4.1. Housing

Entire adult males from both species can be more solitary than females and young offspring. They may be aggressive, particularly during the breeding season, requiring careful management to reduce the risks of fighting and injury to handlers.

Horned and polled goats should not be housed together.

4.2. Enrichment

Sufficient raised areas of appropriate size and quantity to prevent dominant animals impeding access should be provided for goats.

4.3. Enclosures – dimensions and flooring

Table G.2. Sheep and Goats: Minimum enclosure dimensions and space allowances

<table>
<thead>
<tr>
<th>Body weight (kg)</th>
<th>Minimum enclosure size (m²)</th>
<th>Minimum floor area/animal (m²/animal)</th>
<th>Minimum partition height* (m)</th>
<th>Trough space for ad-libitum feeding (m/animal)</th>
<th>Trough space for restricted feeding (m/animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 20</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>over 20 to 35</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>over 35 to 60</td>
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<td></td>
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<tr>
<td>over 60</td>
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* For adult goats, an increased minimum partition height may be required to prevent escape.

The entire enclosure should have a solid floor with appropriate bedding provided.
4.4. Watering
In indoor enclosures for sheep and goats at least one drinking point per twenty animals should be provided.

4.5. Identification
In addition to legally required identification, dyeing the fleece or coat using recognised non-toxic agricultural marker products may be used for short-term experiments in short-wool breeds of sheep and in goats.
1. Introduction

The domestic pig (*Sus scrofa*) is descended from the European wild boar. Although subject to intensive selection pressure over many generations for production characteristics of economic importance, domesticated pigs have largely retained the same behavioural repertoire as their ancestors. Under unrestricted conditions, they live in small family groups, show a crepuscular diurnal rhythm and have strongly developed exploratory behaviour. They are omnivorous and a large part of their active time is spent foraging for food. At birth, sows farrow in social isolation and construct a nest prior to parturition. Weaning is gradual and is completed at about four months of age, and piglets integrate gradually into the social group with little aggression.

Mini-pigs differ from the farm pig in many significant respects. A number of different mini-pig strains have been developed by conventional breeding procedures in order to produce a small pig suitable for research purposes. For the purpose of this document, the mini-pig is defined as a small pig breed for use in experimental and for other scientific purposes and with an adult body weight typically not exceeding 60 kg, but can be as high as 150 kg in some strains. Because of this difference in body size at maturity, recommendations for farm pigs cannot always be extrapolated on a simple weight basis. Recommendations in this document apply to both types of pig, with specific requirements of mini-pigs annotated where necessary.

2. The environment and its control

2.1. Temperature

Pigs and mini-pigs are highly sensitive to environmental temperature and place a high behavioural priority on thermoregulation.

Pigs may be kept in a uniform, temperature-controlled environment, in which case the whole room should be maintained within the thermoneutral zone.
Alternatively, they may be kept in an enclosure with different microclimates, by providing localised heating or kennelling of the lying area and provision of adequate bedding material. A temperature gradient within the enclosure is considered beneficial. Pigs provided with optimal temperature and temperature gradients will naturally divide their pen into feeding, sleeping and dunging areas. Outdoor pigs can compensate for lower ambient temperatures provided that adequate shelter, with plentiful dry bedding, and additional food is provided.

**Table G.3. Pigs and minipigs: Guideline temperature ranges for single-housed animals**

<table>
<thead>
<tr>
<th>Liveweight</th>
<th>Recommended temperature range (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 3 kg</td>
<td>30 to 36</td>
</tr>
<tr>
<td>from 3 to 8 kg</td>
<td>26 to 30</td>
</tr>
<tr>
<td>over 8 to 30 kg</td>
<td>22 to 26</td>
</tr>
<tr>
<td>over 30 to 100 kg</td>
<td>18 to 22</td>
</tr>
<tr>
<td>over 100 kg</td>
<td>15 to 20</td>
</tr>
</tbody>
</table>

In addition to body weight, suitable temperatures will vary according to sexual maturity, the presence or absence of bedding, group housing, and the caloric intake of the animal. Within the ranges given, animals of lower body weight, without bedding or with restricted caloric intake should be provided with the higher temperatures.

Piglets of low body weight are very sensitive to environmental temperature and should be provided with higher temperatures. Litters of newborn piglets should be offered a lying area minimum of 30°C, decreasing to 26°C at the age of two weeks. For farrowing/lactation rooms, the minimum room temperature necessary is that required to allow an adequate temperature to be maintained in the piglet lying area, taking account of any local heat supply. Because of their high metabolic activity, lactating sows are prone to heat stress and farrowing room temperatures should ideally not exceed 24°C.
3. Health
(See paragraph 3 of the general considerations for farm animals and mini-pigs)

4. Housing, enrichment and care

4.1. Enrichment

Pigs show spatial separation of different behaviours such as lying, feeding and excretion. Enclosures should therefore allow for the establishment of separate functional areas by providing either plentiful space or appropriate subdivision of the enclosure area.

Pigs have a high motivation to explore and should be provided with an environment of sufficient complexity to allow expression of species-specific exploratory behaviour. All pigs should at all times have access to adequate amounts of materials for investigation and manipulation, including rooting, in order to reduce the risk of behavioural disorders.

4.2. Enclosures – dimensions and flooring

Table G.4. details the minimum space requirement for an animal on the basis of liveweight. Enclosures should be designed to accommodate the highest liveweight that pigs will finally reach in any given circumstance. The number of times an animal needs to be moved to a new enclosure should be minimised.
### Table G.4. Pigs and Minipigs: Minimum enclosure dimensions and space allowances

<table>
<thead>
<tr>
<th>Liveweight (kg)</th>
<th>Minimum enclosure size* (m²)</th>
<th>Minimum floor area per animal (m²/animal)</th>
<th>Minimum lying space per animal (in, thermoneutral conditions) (m²/animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 5</td>
<td></td>
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<tr>
<td>over 5 to 10</td>
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<tr>
<td>over 10 to 20</td>
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<tr>
<td>over 20 to 30</td>
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<tr>
<td>over 30 to 50</td>
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<tr>
<td>over 50 to 70</td>
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<tr>
<td>over 70 to 100</td>
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<tr>
<td>over 100 to 150</td>
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<tr>
<td>over 150</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Adult (conventional) boars</td>
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</tbody>
</table>

* Pigs may be confined in smaller enclosures for short periods of time, for example by partitioning the main enclosure using dividers, when justified on veterinary or experimental grounds, for example where individual food consumption is required.

Where pigs are housed individually or in small groups, greater space allowances per animal are required than for those in larger groups.

Pigs should not be tethered at any time, and should not be confined in stalls or crates except for short periods of time necessary for feeding, insemination, veterinary or experimental purposes. The accommodation for sows and piglets should enable the fulfilment of the special behaviour patterns of the sow before and after parturition, and those of the piglets after birth. Thus, although the use of farrowing crates can safeguard piglet survival and welfare under some conditions, the close confinement of sows during the perinatal and suckling periods should be limited as far as possible and loose housing systems should be aimed at. The most appropriate flooring material will depend on the size and weight of the pigs. To facilitate provision of rooting/nesting substrate, it is desirable to provide a solid floor in the lying area of the pen. Slatted floors can be of value in facilitating good hygiene, and when used the slat and void dimensions should be appropriate to the size of the pig to prevent foot injuries.
4.3. Feeding

Pigs kept for meat production are typically fed *ad libitum* until approaching maturity, after which restricted feeding practices are necessary to avoid obesity. Mini-pigs are prone to become obese on conventional pig diets. Special reduced calorie diets with increased fibre content help to prevent this problem. Where feed restriction is necessary, pigs will show increased foraging motivation which can be expressed as increased activity and aggression, and may precipitate stereotypic oral behaviours. To avoid these problems it is important to modify diets to enhance satiety, for example by providing increased dietary fibre in conjunction with an appropriate foraging substrate such as straw.

With restricted feeding practices, young growing animals should be fed at least twice daily, whereas mature animals should be fed once daily, as an adequate meal size is important for the animal to reach satiety, and will minimise aggression. Where feeding is restricted, all individuals within the social group should have access to feed without causing aggression. Adequate trough space should be provided to ensure that animals can feed simultaneously. Recommended requirements are given in Table G.5. Where animals are housed singly or in small groups, the minimum trough space should be that for restricted feeding. When animals are housed in larger groups and fed *ad libitum*, trough space can be shared and a lower total space is required.

Table G.5. Pigs and minipigs: Minimum feeding trough space allowances

<table>
<thead>
<tr>
<th>Liveweight (kg)</th>
<th>Minimum trough space (cm) (<em>ad-libitum and restricted feeding</em>)</th>
<th>Minimum trough space per animal on <em>ad-libitum</em> feeding (cm/animal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>over 10 to 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>over 20 to 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>over 30 to 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>over 50 to 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>over 70 to 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>over 100 to 150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>over 150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.4. Watering

As pigs are particularly sensitive to the consequences of water deprivation, in cases where they are group-housed, at least two drinking points per unit – or a large bowl allowing more than one pig to drink at the same time – should be provided to prevent dominant animals impeding access to the drinking point.

To achieve this, the following drinking space allowances are recommended.

**Table G.6. Pigs and minipigs: Minimum drinking point allowances**

<table>
<thead>
<tr>
<th>Drinker type</th>
<th>No. of pigs per drinking point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nipple or bite drinkers</td>
<td>10</td>
</tr>
<tr>
<td>Large bowl drinkers (which allow at least two pigs to drink at the same time)</td>
<td>20</td>
</tr>
</tbody>
</table>

Where pigs housed in larger groups are watered from an open trough, the minimum length of trough perimeter with access to water should be that allowing a single pig unimpeded access (as indicated in Table G.5. for restricted feeding space), or 12.5 mm of trough length per pig, whichever is the greater.

**Table G.7. Pigs and minipigs: minimum drinking water flow rates for pigs**

<table>
<thead>
<tr>
<th>Type of pig</th>
<th>Minimum water flow rate (ml/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weaners</td>
<td></td>
</tr>
<tr>
<td>Growers</td>
<td></td>
</tr>
<tr>
<td>Dry sows and boars</td>
<td></td>
</tr>
<tr>
<td>Lactating sows</td>
<td></td>
</tr>
</tbody>
</table>

4.5. Substrate, litter, bedding and nesting material

Bedding contributes to pig welfare in many ways. It enhances physical and thermal comfort (except in hot environmental conditions), can be eaten to provide gut fill and enhance satiety, and provides a substrate for foraging and nest-building behaviours. The extent to which each of these different benefits can be provided will depend on the nature of the bedding, with long straw
providing the best overall material but alternatives such as chopped straw, sawdust, wood shavings and shredded paper conferring some benefits. Bedding should be non-toxic and, where possible, provide structural diversity to stimulate exploratory behaviour. Bedding should be provided for all pigs, unless precluded for experimental reasons, and is particularly important for farrowing sows, which have a strong motivation to perform nest-building behaviour, and for pigs on restricted feeding regimes, which have a strong motivation to express foraging behaviour.
1. Introduction

Equines evolved as grazers of open grasslands, and domestic horses and ponies (*Equus caballus*) and donkeys (*Equus asinus*) have retained the behavioural repertoire of their ancestors. In the feral or free-ranging state, equines live in herds separated into small family groups or bands typically comprising one stallion, with several mares, foals and yearlings. The social structure develops as a clearly defined hierarchy, and individual animals within a group often form close pair bonds which it is important to recognise and maintain if possible. Mutual body care is a particularly important element in their social life.

Unlike ruminants, equines may graze continuously for many hours and under natural conditions they will spend fourteen to sixteen hours daily at this activity. Although their natural food is grass, herbs, and leaves, they are very selective regarding their choice of grass species and which part of the plant to eat. Their normal daily pattern is to graze, move a few steps and graze again. In this way they exercise as well as feed, and can cover long distances in a twenty-four hour period.

Ideally, management systems for equines should accommodate their natural behaviour, in particular the need to graze, exercise, and socialise. They are flight animals and hence easily startled and this should also be taken into account.

2. The environment and its control

Rugs can be used in cool conditions, especially if hair has been clipped. Rugs should be removed when horses undergo their daily check.
The mane and tail of equines provide protection from adverse weather conditions and from flies and should not be removed or cut short. Where manes and tails need to be shortened or tidied this should be achieved by trimming rather than by pulling.

3. Health

(See paragraph 3 of the General considerations for farm animals and mini-pigs)

4. Housing, enrichment and care

4.1. Enclosures – dimensions and flooring

Ideally, equines should be kept at pasture or have access to pasture for at least six hours a day. Where equines are kept with minimal or no access to grazing then additional roughage should be provided to extend the time spent feeding and reduce boredom.

In indoor enclosures, group-housing systems are preferred since these provide opportunities for socialisation and exercise. For horses it is essential that great care is taken to ensure social compatibility of groups.

The total space requirement for indoor enclosures will depend on whether animals also have daily access to additional areas for grazing and/or other forms of exercise. The figures below assume that such additional areas will be provided. If not, then space allowances should be increased significantly.
Table G.8. Equines: Minimum enclosure dimensions and space allowances

<table>
<thead>
<tr>
<th>Wither height (m)</th>
<th>Minimum floor area/animal (m²/animal)</th>
<th>Foaling box / mare with foal</th>
<th>Minimum enclosure height (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For each animal held singly or in groups of up to 3 animals</td>
<td>For each animal held in groups of 4 or more animals</td>
<td></td>
</tr>
<tr>
<td>1.00 to 1.40</td>
<td>6.0</td>
<td>16</td>
<td>3.00</td>
</tr>
<tr>
<td>over 1.40 to 1.60</td>
<td>9.0</td>
<td>20</td>
<td>3.00</td>
</tr>
<tr>
<td>over 1.60</td>
<td>(2 x WH)² *</td>
<td>20</td>
<td>3.00</td>
</tr>
</tbody>
</table>

* To ensure adequate space is provided, space allowances for each individual animal should be based on height to withers (WH).

The shortest side should be a minimum of 1.5 x the wither height of the animal.

The height of indoor enclosures should allow animals to rear to their full height to safeguard the welfare of the animals.

Slatted floors should not be used for equines.

4.2. Feeding

Incorrect feeding of equines can have very serious welfare implications, causing illnesses such as colic and laminitis.

Since they naturally graze for long periods, they should ideally have constant access to forage in the form of fresh grass, hay, silage or straw. Where they are not given the opportunity to graze, they should be provided with a suitable quantity of long fibre/roughage every day. Where possible roughage should be fed on the ground or in suitably designed round bale feeders. Hay nets and racks should be designed and positioned to minimise risk of injury.

If “hard” (concentrate) feed is offered to animals, particularly where the animals are housed in groups the feeding order should, where possible, follow the herd order of dominance. Where possible, individuals should be fed
separately. If this is not possible feeding points should be spaced at least 2.4 m apart and there should be at least one point per animal. Horses fed with concentrates need to be given small amounts of feed frequently.

4.3. Watering

Horses prefer to drink from an open water surface, and this should be provided where possible. If automatic water nipple drinkers are used, animals may need to be trained to use them.

4.4. Identification

Ear tags and tattooing should not be used in equines. If identification other than coat colour is required then transponders should be used. Numbered head-collars and hanging tags for halters have also been used successfully for identification.