



**NORECOPA-Consensus Meeting:
Harmonisation of the Care and Use
of Agricultural Animals in Research**
26-28 September 2012, Gardermoen, Norway

Challenges in Farm Animal Research: the Protectionist's View



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Farm animal - definitions

Livestock

From Wikipedia, the free encyclopedia

(Redirected from [Farm animal](#))

For other uses, see [Livestock \(disambiguation\)](#).

Livestock are [domesticated animals](#) raised in an agricultural setting to produce [commodities](#) such as [food](#), [fiber](#) and [labor](#). This article does not discuss [poultry](#) or farmed [fish](#), although these, especially poultry, are commonly included within the meaning of "livestock".



Farm animal - definitions

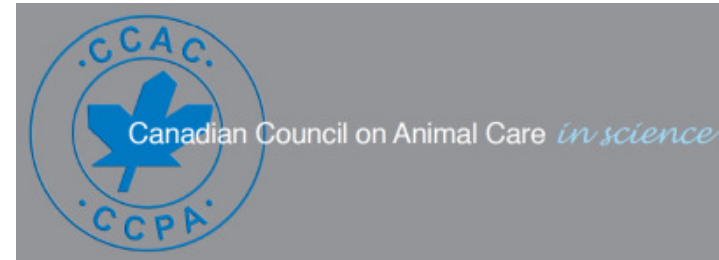
Saunders Comprehensive Veterinary Dictionary, 3 ed.

farm animal

animals used for the production of human and animal food and feed, fiber, skin and hide and, to the extent that they are used in farm work, bullocks and horses used in the hauling of freight and for transport.



Farm animal - definitions



2.1 Definition of Farm Animal

For the purposes of this document, the term farm animal refers to a mammal or bird commonly kept for agricultural purposes, including for food, fibre, fertilizer or work. The use of fish to support the aquaculture industry is covered by the *CCAC guidelines on: the care and use of fish in research, teaching and testing* (CCAC, 2005). This guidelines document provides species-specific information on cattle, sheep, pigs and poultry; however, the general principles also apply to other types of farm animals, including farmed wildlife.



Farm animal - definitions

- Definition in Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes:

Article 2

For the purposes of this Directive the following definitions shall apply:

1. 'animal': any animal (including fish, reptiles or amphibians) bred or kept for the production of food, wool, skin or fur or for other farming purposes;

- Definition in the European Convention for the Protection of Animals Kept for Farming Purposes of the Member States of the Council of Europe:

For the purposes of this Convention, "animals" shall mean animals bred or kept for the production of food, wool, skin or fur or for other farming purposes

- The Statistical Reports on Animals used for Scientific Purposes of the EU, UK, Germany and Norway do not make a distinction between „laboratory animal“ and „farm animal“, but rather a subdivision into species



Statistics: EU

	2005	2008
horses, donkeys, and crossbreeds	5312	5976
pigs	66305	92813
goats	2146	3840
sheep	30021	30190
cattle	36271	33952
all ungulates	140055	166771

birds (unspecified as to farm use)	659059	764111
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Public Outrage Over Experiments Using Pigs

2010: 29 pigs to be buried alive (though anaesthetized) under simulated avalanches in Austria → planned investigation of mechanisms of death in people submerged in snow

Outraged public protests stopped these experiments after ten pigs used



Protection of animals in the EU

Animal Welfare:

- Treaty on the Functioning of the European Union (TFEU), amended 2009:

"In formulating and implementing the Union's agriculture, fisheries, transport, internal market, research and technological development and space policies, the Union and the Member States shall, since animals are sentient beings, pay full regard to the welfare requirements of animals, while respecting the legislative or administrative provisions and customs of the Member States relating in particular to religious rites, cultural traditions and regional heritage."



Special requirements for experiments on farm animals in Directive 2010/63/EU

- Article 1, Paragraph 5:
“This Directive **shall not apply to** the following:
(a) **non-experimental agricultural practices;**”
- Article 5
“Procedures may be carried out for the following purposes only: (...)
(b) translational or applied research with any of the following aims: (...)
(iii) **the welfare of animals and the improvement of the production conditions for animals reared for agricultural purposes;**”



Special requirements for experiments on farm animals in Directive 2010/63/EU

- Annex III

Requirements for Establishments and for the Care and Accommodation of Animals

*“During **agricultural research**, when the aim of the project requires that the animals are kept under similar conditions to those under which commercial farm animals are kept, the keeping of the animals shall comply at least with the standards laid down in Directives 98/58/EC, 91/629/EEC and 91/630/EEC.”*

- Requirements for farm animals in Annex IV for Methods of Killing Animals:

“1. In the process of killing animals, methods listed in the table below shall be used. (...)

*(b) on **animals used in agricultural research**, when the aim of the project requires that the animals are kept under similar conditions to those under which commercial farm animals are kept; these animals may be killed in accordance with the requirements laid down in Annex I to Council Regulation (EC) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing*



EU-legislation re. farm animals

- [Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes](#)
 - **does not apply to** *animals living in the wild; animals intended for use in competitions, shows, cultural or sporting events or activities; **experimental or laboratory animals**; any invertebrate animal (Article 1)*
 - These rules are based on the [European Convention for the Protection of Animals kept for Farming Purposes](#).
- They reflect the so-called '**Five Freedoms**' as adopted by the UK's Farm Animal Welfare Council:
- *Freedom from hunger and thirst - access to fresh water and a diet for full health and vigour,*
 - *Freedom from discomfort - an appropriate environment with shelter and comfortable rest area,*
 - *Freedom from pain, injury and disease - prevention or rapid treatment,*
 - *Freedom to express normal behaviour - adequate space and facilities, company of the animal's own kind,*
 - *Freedom from fear and distress - conditions and treatment which avoid mental sufferings.*



EU-legislation re. farm animals

- Council Directive 1999/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens
and
- Council Directive 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production
- Council Directive 2008/119/EC of 18 December 2008 laying down minimum standards for the protection of calves
- Council Directive 2001/88/EC of 23 October 2001 amending Directive 91/630/EEC laying down minimum standards for the protection of pigs
and
- Commission Directive 2001/93/EC of 9 November 2001 amending Directive 91/630/EEC laying down minimum standards for the protection of pigs



Range of use of farm animals for scientific purposes

- Veterinary medicine and R&D of veterinary drugs (all farm animal species)
- Basic research (all farm animal species)
- Research into cardiovascular system and cardiovascular diseases (mostly pigs)
- Xenotransplantation (mostly pigs)
- Research into orthopaedics and surgical techniques (mostly sheep and pigs)
- Research into housing conditions, feeding studies (all farm animal species)
- Cloning, gene pharming, i.e. use of genetically modified animals for production of e. g. food additives or pharmaceuticals (e. g. cattle, pigs, goats, sheep)
- Production of biological reagents and diagnostics (horses, cattle, goats, sheep and many others)



Animal Welfare Concerns of Farm Animal Breeding

Broilers

Age at 1500 g BW
120 days to 40 days

Maximisation of
growth rate
(1925 – 1998):



Animal Welfare Concerns of Farm Animal Breeding

Some breeding-related animal welfare problems in poultry

- osteoporosis (laying hens)
- leg disorders (broilers, turkeys)
- cardio-vascular insufficiency/sudden death syndrome and ascites (broilers, turkeys)
- excessive appetite (broiler breeders)



Animal Welfare Concerns of Farm Animal Breeding

Broilers – leg disorders

Angular limb deformity (outward or inward angulation of the limb at the intertarsal joint) - the most common long bone distortion in broilers (SCAHAW 2000)



Animal Welfare Concerns of Farm Animal Breeding

Pigs

Maximisation of growth rate: time (months) to reach 100 kg



Animal Welfare Concerns of Farm Animal Breeding

Some breeding-related animal welfare problems in pigs

(selected for increased muscle blocks and increased fertility)

- skeletal problems, osteochondrosis (→ lameness)
- cardiovascular problems (→ PSS, back muscle necrosis)
- increased number of weak piglets (→ increased mortality)



Animal Welfare Concerns of Farm Animal Breeding

Some breeding-related animal welfare problems in pigs (selected for increased muscle blocks and increased fertility)

Osteochondrosis
syndrome
(ischial tuberosity
detachment)



Animal Welfare Concerns of Farm Animal Breeding

Some breeding-related animal welfare problems in pigs (selected for increased muscle blocks and increased fertility)

Back muscle necrosis



Animal Welfare Concerns of Farm Animal Breeding

Dairy cattle -

Percentage increase
of the cause of
death in dairy cattle
in Germany
1960 - 2000

udder diseases:
+ 600%

claw and limb
diseases
+ 300%

milk yield:
+ 40%



Animal Welfare Concerns of Farm Animal Breeding

Some breeding-related animal welfare problems in beef cattle (selected for hypermuscularity/high meat production)

- leg disorders (→ lameness)
- increase in calving difficulties (→ high proportion of caesareans)
- decrease in longevity
- higher susceptibility to stress (particularly homozygous carriers of myotrophin defective gene, or double muscled animals)



Animal Welfare Concerns of Using Farm Animals

Requirements of farm animals

Most farm animal species like

- cattle
- pigs
- sheep
- goats
- chickens

are social and require the contact of their own kind. Isolation under experimental conditions is recognized as suffering in Directive 2010/63; Annex VIII



Animal Welfare Concerns of Using Farm Animals

General rules of enrichment

- Environmental enrichment must result in a demonstrable improvement for the animal.
- Appropriate environmental enrichment requires consideration of the species and individual needs and the circumstances and duration of animal use.
- What may be environmental enrichment for one animal may be a stressful situation for another.
- We must understand the impact of the environment on the animal and the possible reasons for abnormal behaviours.



Animal Welfare Concerns of Using Farm Animals

Special requirements of farm animals + enrichment

Examples:

- Pigs: spending considerable time foraging and in oral + nasal manipulation of objects.
→ provision of substrate suitable for rooting (e.g. peat or earth), balls, ropes, etc
- Herbivorous livestock: herding animals
→ social contact
foraging (walking, seeking and selecting food), ruminating species
→ environmental enrichment to focus on these aspects
- Cattle: self and social grooming; comfort behaviours (e.g. rubbing and scratching)
→ develop devices that allow animals in social isolation to perform these behaviours
- Poultry: foraging by scratching and pecking in substrates
→ provide them with suitable litter.



Animal Welfare Concerns of Using Farm Animals

unique health concerns, size, behavioural attributes and needs of farm animals

→ specially trained personnel and close veterinary medical attention required



Ethical considerations - Legal basis

Directive 2010/63/EU

Art. 38 (d):

“a harm-benefit analysis of the project, to assess whether the harm to the animals in terms of suffering, pain and distress is justified by the expected outcome taking into account ethical considerations, and may ultimately benefit human beings, animals or the environment “

Recital; 12:

The use of animals for scientific or educational purposes should [...] only be considered where a non-animal alternative is unavailable



Public Opinion on Animal Experiments

Some results of a representative opinion poll carried out in 2009 in
six EU Member States
(UK, France, Germany, Italy, Sweden and the Czech Republic)

79% agree the new law should prohibit all experiments on animals which do not relate to serious or life-threatening human conditions.

84% agree the new law should prohibit all experiments causing severe pain or suffering to any animal.

80% agree all information about animal experiments should be publicly available, except information which is confidential and information which would identify researchers or where they work.



Ethical Considerations – Replacement options

- Cell culture methodology for
 - > identification of metabolic pathways
 - > toxicology testing
 - > drug development
 - > vaccine testing
 - > in vitro models of disease including 3D- cell culture models
 - > production of biological reagents, diagnostics and drugs
- Intelligent testing strategies for toxicology testing and drug development
- Use of films, interactive computer models, dummies, cadavers, and clinical training in educational settings
- Genetic studies and
- Epidemiological studies in target organisms (not in “model organisms”) as starting points for drug development



Ethical considerations - Conclusions

- constitutional health problems of breeds compounding the severity of an animal experiment to be taken into account
- benefit must be correspondingly large and likely to ensue to outweigh harm – basic research on animal models with low likelihood to be translatable to humans or other target species to be discouraged
- solely financial / economical considerations cannot justify severe experiments



Ethical considerations - Conclusions

Ethically questionable:

- when alternatives exist, e.g.:
 - experiments for educational purposes → films, dummies, autopsy specimens, clinical training
 - “gene pharming” → production alternatives e.g. cell culture, yeast, bacteria
- experiments / genetic engineering for xenotransplantation → unlikely to benefit humans in the foreseeable future
- experiments / genetic engineering for the sole purpose of adapting animals to crowded, cramped or otherwise bad husbandry conditions



Wrap-up

- In terms of animal welfare, the criterion to apply different standards is neither place nor purpose of use, but susceptibility to pain, suffering or distress (incl. psychological).
- Attempts to introduce livestock into research because of better public acceptance cannot be justified from an ethical point of view.
- Conventional farm animal breeds are often characterized by constitutional health problems. These must be taken into account in the licensing process, in housing and care, and in education and training of personnel.
- Independent of species the 3Rs must be applied to the maximum extent (+ increase of the promotion, development, and application of 3Rs methods)
- no licensing of projects that ethically cannot be justified



Thank you for your attention!

+ thanks to Ulrike Gross, Kristina Wagner (Animal Welfare Academy)

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