

Module 11

Livestock Welfare Assessment (Part 2)



- ❖ Pigs
- ❖ Laying hens and broilers
- ❖ Other farmed species
- ❖ How to improve livestock welfare

This lecture was first developed for **World Animal Protection** by Dr David Main (University of Bristol) in 2003. It was revised by **World Animal Protection** scientific advisors in 2012 using updates provided by Dr Caroline Hewson.

Free online resources

To get free updates and additional materials, please go to
www.animalmosaic.org/education/tertiary-education/

This module will teach you

The main welfare problems in

- ✦ Pigs
- ✦ Poultry
- ✦ Other farmed species

How to improve livestock welfare

- ✦ Genetics
- ✦ Incentives and enforcement
- ✦ Your role as a veterinarian

Welfare of pigs

(Arey & Brooke, 2006)

Sows

Piglets

Fattening pigs

Sow husbandry systems: stalls

Single stalls

+ / – tether

Dunging channel at back

Floor – slats or solid concrete

No bedding

Feeding

Individual



Sow husbandry systems: loose housed

Groups of 4–100

Controlled environment, indoors

Floor: slats or solid concrete

+ / – straw

Feeding

Individual: electronic

Group: scattered on floor or in stalls

Ad libitum liquid



Sow husbandry systems: free range

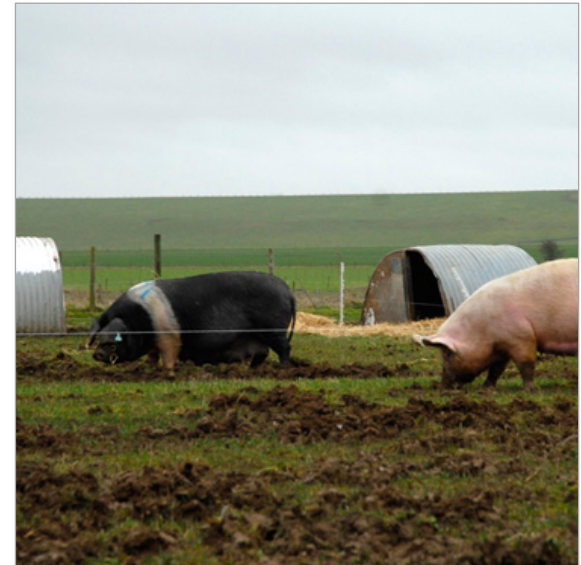
Outside

Shelters provided

Straw bedding

Forage – rooting

Supplementary feed as necessary



Sow husbandry systems: farrowing crates

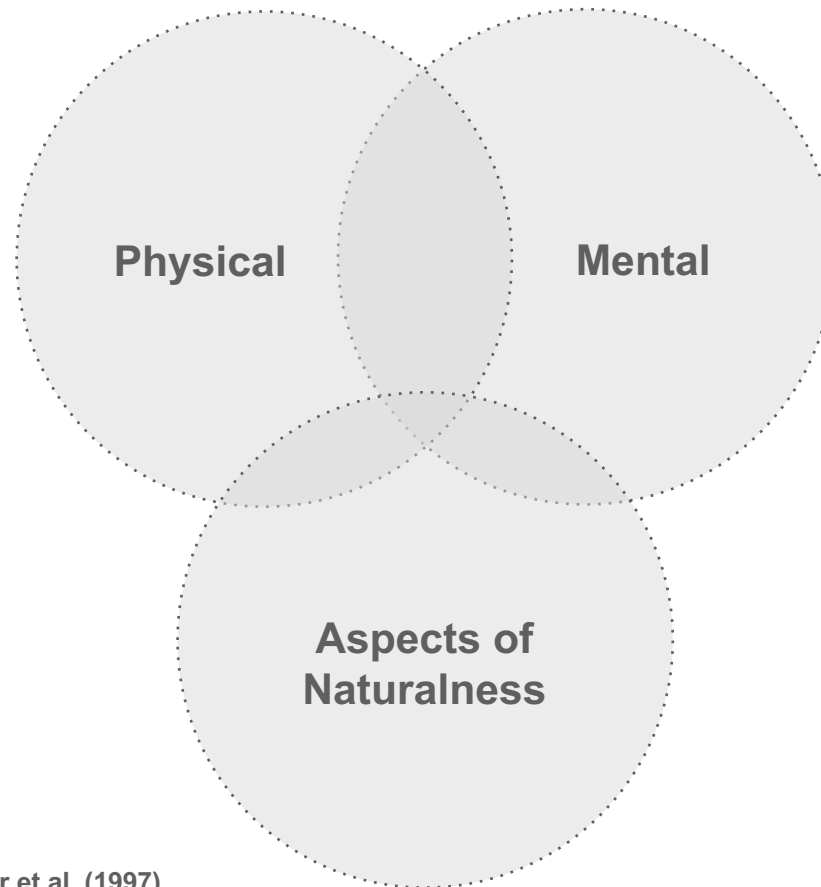
Reduce crushing of piglets

For sows in single stalls,
and some loose housed sows

Kept in crate for ~5 weeks



Three approaches when considering animal welfare



After Appleby, M. C. (1999) and Fraser et al. (1997)

Review: areas of welfare

(Welfare Quality® project)

Area	Criteria
1. Good feeding	Animals should not suffer from prolonged hunger
	Animals should not suffer from prolonged thirst
2. Good housing	Animals should have comfort around resting
	Animals should have enough space to allow ease of movement
	Animals should have thermal comfort
3. Good health	Animals should be free of physical injuries
	Animals should be free of disease
	Animals should not suffer pain caused by procedures
4. Appropriate behaviour	Animals should have a positive emotional state, and negative emotions should be avoided as far as possible
	Animals should be able to express normal social behaviours
	Animals should be able to express species-typical behaviours
	Promotion of good human–animal relationships

Area	Criteria	Common welfare problems in sows
1. Good feeding	No prolonged hunger	Hunger: genetics of fast-growing pigs; competition
2. Good housing	Comfort around resting	Inadequate resting area (space, bedding)
	Ease of movement	Little ease of movement
	Thermal comfort	Too hot/cold/humid
3. Good health	Free of physical injuries	Bedding; vulva biting, fighting
	Free of disease	Joint disorders and muscle weakness (genetics, husbandry); vaginitis (single stalls)
	Should not suffer pain caused by procedures	Nose rings in free-range systems
4. Appropriate behaviour	Should have a positive emotional state	Negative emotional states, e.g. frustration; anxiety/fear (bullying)
	Able to express species-typical behaviours	No rooting, no nesting
	Good human–animal relationships	Fear

Area 1: good feeding

Genetic selection for fast-growing piglets

Large appetite = inherent problem

- Adults could become obese ⇒ skeletal disorders and pain + reduced fertility (German, 2010; van Grevenhof et al., 2012)
- Costly to feed

Must restrict feeding

- Eg withhold food one day per week; feed small amount per meal
- Competition for food – fighting

Frustration if cannot root

Stalls: lower welfare potential than loose housing or free range

Area 2: good housing

Restriction of movement

- ✦ **Stalls: confining; may be too small for newer generations of sow; leg weakness ✦✦ pain**
- ✦ **Farrowing crates**

Lack of bedding

- ✦ **Stalls and some loose housing – calluses, bursitis**
- ✦ **Stony ground in outdoor systems**

Thermal discomfort

- ✦ **Free-range systems, e.g. sunburn, cold – lack of wallowing areas**
- ✦ **Indoor systems – poor ventilation ⇒ heat stress**

Stalls = lowest welfare potential

Area 3: good health 1

Foot disorders – pain, lameness

- ✦ Lack of bedding – stalls, some loose housing
- ✦ Slatted floors (Kilbride et al., 2009)
- ✦ Stony ground
- ✦ Genetics

Urogenital infections

- ✦ Stalls

Neck sores

- ✦ Stalls – tethers

Area 3: good health 2

Ease of monitoring

Nose ringing – outdoor sows

(Stafford & Mellor, 2010)

Pain

Stalls = lowest welfare potential

Area 4: appropriate behaviour

Negative emotions and inability to express important behaviours

Fear

Inability to get away from other sows – fighting, bullying

Rough handling

Frustration

Inability to root in response to hunger, and as natural part of time budget – exploration

Stereotypies, passivity, aggression

Inability to nest before parturition

Welfare of sows in farrowing crates 1

Genetics

- ❖ Large numbers of piglets
- ❖ Large sows with relatively weak legs ❖ clumsy when they lie down

Stall system

- ❖ Lack of locomotion ❖ leg weakness too



Welfare of sows in farrowing crates **2**

Area 2 – Good housing

Area 3 – Good health

- ⌘ Increased levels of dystocia and urinary tract infections

Area 4 – Appropriate behaviour

- ⌘ Lack of substrate and space for nesting ⇒ frustration
- ⌘ Unable to bond normally with piglets

Summary so far

Welfare of sows

- ▣ Stalls
- ▣ Loose housing
- ▣ Free range

Next:

- ▣ Welfare of piglets
- ▣ Welfare of growing pigs

Area	Criteria	Common welfare problems in piglets
1. Good feeding	No prolonged hunger	Competition at teats
2. Good housing	Ease of movement	Crushing by sow
	Thermal comfort	Too hot/cold/humid
3. Good health	Free of physical injuries	Crushing by sow; lameness on slatted floors (Kilbride et al., 2009)
	Free of disease	Early weaning: diarrhoea
	Should not suffer pain caused by procedures	Castration, tail docking, teeth clipping
4. Appropriate behaviour	Should have a positive emotional state	Negative emotional states, e.g. frustration; anxiety/fear (bullying)
	Able to express species-typical behaviours	No rooting
	Good human–animal relationships	Fear

Area 3: good health – diarrhoea

**Early weaning: abrupt diet change ❖
diarrhoea**

Immature immune system

**Stress of separation and mixing can
increase susceptibility to disease**



Area 3: good health – painful procedures (Stafford & Mellor, 2010)

Teeth clipping

Tail docking

Castration (Giersing et al., 2006)



Husbandry systems: growing pigs

Slatted

Partially slatted – solid lying area

Concrete – separate lying and dunging areas

Straw or substrate-based

Outdoor



Area	Criteria	Common welfare problems in growing pigs
1. Good feeding	No prolonged thirst	Water supply?
2. Good housing	Ease of movement	High stocking density, dark, high ammonia levels
	Thermal comfort	Too hot/cold/humid
3. Good health	Free from physical injuries	Tail biting, fighting
	Free from disease	Respiratory disease Joint disease and lameness (especially on slatted floors; Kilbride et al., 2009); impact of beta-agonist growth promoters
4. Appropriate behaviour	Animals should have a positive emotional state	Negative emotional states, e.g. frustration; anxiety/fear (bullying)
	Able to express species-typical behaviours	No rooting
	Good human–animal relationships	Fear

When you visit a pig farm

What are the problems?

Welfare outputs, eg

- ⌘ Sows – lameness? stereotypies?
- ⌘ Piglets – diarrhoea?
- ⌘ Growing pigs – fighting?

Why are they occurring – welfare inputs?

Are the problems inherent or avoidable?

Inform the farmer / owner

Support him / her in making changes

Welfare of poultry

Laying hens

Meat chickens

Breeding stock

Husbandry systems: laying hens

(Appleby et al., 2004; Duncan, 2010)

Battery cages

'Furnished cages'

Barns

Deep litter or straw

Aviaries

Percheries

Free range and organic free range

Smallholders

For example, India (Pica-Ciamarra & Otte, 2009)

Rural and urban

The welfare potential of egg production systems



Area	Criteria	Common welfare problems in laying hens (Appleby et al., 2004; Duncan 2010)
1. Good feeding	No prolonged hunger	Forced moulting
2. Good housing	Ease of movement	Little ease of movement, lack of adequate resting area
	Thermal comfort	Too hot/cold/humid; air quality – ammonia and dust
3. Good health	Free from physical Injuries	Feather pecking and cannibalism Osteoporosis (Nasr et al., 2012): Percherries: keel fractures = reduced egg production, more sleep, reduced access to water and food 1,500–3,600 affected birds on each farm (15–30 per cent prevalence)
	Free from disease	Osteoporosis, coccidia, salmonella <i>Dermanyssus gallinae</i> – blood loss; disease vector (Duncan, 2010)
	Should not suffer pain caused by procedures	Beak trimming (Gentle, 2011)

Beak trimming

(Gentle, 2011)

Infrared better than thermocautery

(Gentle & McKeegan, 2007; McKeegan & Philby, 2012)

One day old is best otherwise high risk of neuroma and chronic pain



Credit: Vicky Alhadeff

Area	Criteria	Common welfare problems in laying hens (Appleby et al., 2004; Duncan 2010) continued
4. Appropriate behaviour	Animals should have a positive emotional state	Negative emotional states, e.g. frustration; anxiety/ fear (cannibalism) (Gentle, 2011)
	Able to express species-typical behaviours	Nesting, perching, dust bathing, social distance
	Good human–animal relationships	Fear

Common welfare problems in meat birds

(Appleby et al., 2004)



Area	Criteria	Common welfare problems in meat birds (Appleby et al., 2004)
1. Good feeding	No prolonged hunger	Genetics; competition
2. Good housing	Comfort around resting	Lack of adequate resting area (space, bedding)
	Ease of movement	Little ease of movement
	Thermal comfort	Ammonia and dust
3. Good health	Free from disease	Joint disorders and muscle weakness Contact dermatitis – feet, hocks, chest Cardiac insufficiency (Gentle, 2011)
	Should not suffer pain caused by procedures	Beak-trimming; in cockerels, de-toeing and spur removal, comb and wattle removal, caponisation/ castration

Area	Criteria	Common welfare problems in meat birds (Appleby et al., 2004) continued
4. Appropriate behaviour	Able to express species-typical behaviours	Expression of species-typical behaviours, especially in parent stock
	Good human–animal relationships	Fear

Welfare of other livestock

Other livestock

Mammals

Sheep, goats, deer, peccaries, rabbits, guinea pigs

Birds

Ducks, geese, quail, turkeys, ratites (ostriches, rhea)

Reptiles

Crocodiles, snakes

Fish and shellfish

Salmon, tilapia, lobster, etc.

Areas of welfare

(Welfare Quality® project)

Area	Criteria
1. Good feeding	Animals should not suffer from prolonged hunger
	Animals should not suffer from prolonged thirst
2. Good housing	Animals should have comfort around resting
	Animals should have enough space to allow ease of movement
	Animals should have thermal comfort
3. Good health	Animals should be free of physical injuries
	Animals should be free of disease
	Animals should not suffer pain caused by procedures
4. Appropriate behaviour	Animals should have a positive emotional state
	Animals should be able to express normal social behaviours
	Animals should be able to express species-typical behaviours
	Promotion of good human–animal relationships

Examples of welfare problems in other livestock

Area	Other examples
1. Good feeding	Sheep – prolonged hunger
	Geese – force feeding – foie gras
2. Good housing	Rabbits – cages, no enrichment, not enough space to stand or hop
3. Good health	Turkeys – lameness and cardiac insufficiency
4. Appropriate behaviour	Peccaries – inability to roam and forage = unpleasant? (Nogueira et al., 2011)

How to improve livestock welfare



Improving livestock welfare

Welfare inputs

Farming system

- ⌘ Welfare potential
- ⌘ Role of economics

Genetics

Stockperson

Incentives and penalties

Social – personal pride; opinion of peers

Economic, e.g. quality assurance schemes

Legislation, e.g. minimum requirements for each system; prohibiting certain systems

Role of the veterinarian

Improving pig welfare 1

Farming system

❖ Loose housed with bedding and 'manipulable' material

- Avoid slats

❖ Outdoor

❖ Feeding

- High-fibre diet for sows to reduce hunger
- Enough feeding space

❖ Farrowing pens

- Straw and enough room for sow to turn around
- Escape area for piglets

❖ Hospital pen for sick pigs (Millman, 2007)

Improving pig welfare **2**

Genetics

Lower growth rate; less aggression / tail biting; good mothering; less boar taint?

Stockperson

Gentle handling; biosecurity; vaccination against boar taint (Giersing et al., 2006); reluctance to change (De Lauwere et al., 2012)

Incentives, penalties and legislation

For example, the Philippines (Arey & Brooke, 2006)

Role of the veterinarian

Improving chicken welfare 1

Farming system

- ✦ **Hens and breeding stock – barns or free range, not cages (Duncan, 2010)**
- ✦ **Beak-trim with infra-red, not thermocautery?**
- ✦ **Care of organic, free-range broilers:**
 - Slaughter at ~8 weeks, not 6 weeks
 - Use a slow-growing breed to avoid problems of hunger and leg weakness
- ✦ **Hospital pen? (Millman, 2007)**

Improving chicken welfare **2**

Genetics

Lower growth rate; less cannibalism; low fear

Stockperson

Improve working conditions

Education – handling, biosecurity, etc.

Incentives, penalties and legislation

Role of the veterinarian

Improving cattle welfare 1

Farming system

- ❖ Dairy cows: avoid housing if climate permits (Laven & Holmes, 2008)
- ❖ Calves: group housing, nipple drinkers (von Keyserlingk et al., 2009)
- ❖ Hospital pen (Millman, 2007)

Genetics

- ❖ Dairy cows – include fertility and health traits, not just production traits (Oltenacu & Algers, 2005)
- ❖ Polled breeds
Test for DNA marker for polled vs. horned gene in Brahman bulls

Improving cattle welfare 2

Stockperson

- ⌘ Gentle handling and milk yield
- ⌘ Range of motivations for complying with your advice (Lam et al., 2011)
- ⌘ Knowledge, eg lameness in dairy cows (Leach et al., 2010)

Incentives, penalties and legislation

Role of the veterinarian

Summary

Four-point welfare framework

Ways to improve welfare

NB hospital pen (Millman, 2007)

OIE Code: *Terrestrial Animal Health Standards* (OIE, 2011)

www.oie.int/animal-welfare/animal-welfare-key-themes/

Feedback:

Please let us know what you think

- ❖ How have you used this module?
- ❖ What did you like about it?
- ❖ What did you not like?
- ❖ Do you have any tips to share?

Please take part in our 10 minute survey here:

<https://www.surveymonkey.com/s/BKP3D6H>

Your feedback will help other teachers like you

References

- Appleby, M. C. (1999). *What Should We Do About Animal Welfare?* Oxford: Blackwell.
- Appleby, M. C., Mench, J. A., & Hughes, B. O. (2004). *Poultry behaviour and welfare*. Wallingford, UK: CABI.
- Arey, D., & Brooke, P. (2006). *Animal welfare aspects of good agricultural practice: pig production*. Petersfield, UK: Compassion in World Farming.
- De Lauwere, C., van Asseldonk, M., van't Riet, J., de Hoop, J., & ten Pierick, E. (2012). Understanding farmers' decisions with regard to animal welfare: The case of changing to group housing for pregnant sows. *Livestock Science*, 143, 151-161.
- Duncan, I. J. H. (2010). Cracking the egg. In J. D'Silva & J. Webster (Eds.), *The meat crisis: Developing more sustainable production and consumption* (pp. 117-132). London: Earthscan.
- Fiks-van Niekerk, T., & de Jong, I. (2007). Mutilations in poultry in European poultry production systems. *Lohmann Information* 42: 35-46. (Available at: http://www.lohmann-information.com/content/l_i_42_2007-04_artikel5.pdf)
- Fraser, D., Weary, D.M., Pajor, E.A., Milligan, B.N. (1997). A scientific conception of animal welfare that reflects ethical concerns. *Animal Welfare*, 6: 187-205
- Gauly, M., Duss, C., & Erhardt, E. (2007). Influence of *Ascaridia galli* infections and anthelmintic treatments on the behaviour and social ranks of laying hens (*Gallus gallus domesticus*). *Veterinary Parasitology* 146: 271–280
- Gentle, M. J. (2011). Pain issues in poultry. *Applied Animal Behaviour Science*, 135, 252-258.
- Gentle, M. J., & McKeegan, D. E. F. (2007). Evaluation of the effects of infrared beak trimming in broiler breeder chicks. *Veterinary Record*, 160, 145-148.
- German, A. (2010). Obesity in companion animals. *In Practice*, 32: 42-50
- Giersing, M., Ladewig, J., & Forkman, B. (2006). Animal welfare aspects of preventing boar taint. *Acta Veterinaria Scandinavica*, 48 (supplement 1), S3.
- Kilbride, A., Gillman, C., Ossent, P., & Green, L. E. (2009). Impact of flooring on the health and welfare of pigs. *In Practice*, 31, 390-395.
- Lam, T. J., Jansen, J., van den Borne, B. H., Renes, R. J., & Hogeveen, H. (2011). What veterinarians need to know about communication to optimise their roles as advisors on udder health in dairy herds. *New Zealand Veterinary Journal*, 59, 8-15.

References

- Laven, R. A., & Holmes, C. W. (2008). A review of the potential impact of increased use of housing on the health and welfare of dairy cattle in New Zealand. *New Zealand Veterinary Journal*, 56, 151-157.
- Leach, K. A., Whay, H. R., Maggs, C. M., Barker, Z.E., & Paul, E.S. (2010). Working towards a reduction in cattle lameness: 1. Understanding barriers to lameness control on dairy farms. *Research in Veterinary Science*, 89, 311-317.
- McKeegan, D.E.F., Philbey, A.W. (2012). Chronic neurophysiological and anatomical changes associated with infra-red beak treatment and their implications for laying hen welfare. *Animal Welfare* 21: 207-217
- Millman, S. T. (2007). Sickness behaviour and its relevance to animal welfare assessment at the group level. *Animal Welfare*, 16, 123-125.
- Nasr, M. A. F., Murrell, J., Wilkins, L. J., & Nicol, C. J. (2012). The effect of keel fractures on egg production parameters, mobility and behaviour in individual laying hens. *Animal Welfare*, 21, 127-135.
- Nogueira, S. S. C., Calazansa, S. G., Costa, T. S. O., Peregrino, H., & Nogueira Filho, S. L. G. (2011). Effects of varying feed provision on behavioural patterns of farmed collared peccary (Mammalia, Tayassuidae). *Applied Animal Behaviour Science*, 132, 193-199.
- Office Internationale des Epizooties (OIE) (2011). Terrestrial Animal Health Code. Available at: <http://www.oie.int/en/international-standard-setting/terrestrial-code/access-online/>
- Office International des Epizooties (OIE) (2011). The OIE's achievements in animal welfare. Retrieved from www.oie.int/animal-welfare/animal-welfare-key-themes/
- Oltencu, P. A., & Algers, B. (2005). Selection for increased production and the welfare of dairy cows: Are new breeding goals needed? *Ambio*, 34, 311-315.
- Pica-Ciamarra, U., & Otte, J. (2009). Poultry, food security and poverty in India: Looking beyond the farm gate. Pro-Poor Livestock Policy Initiative: A Living from Livestock. Research report no. 09-02, February. Rome: Food and Agriculture Organization of the United Nations (FAO).
- Stafford, K. J., & Mellor, D. J. (2010). Painful husbandry procedures in livestock and poultry. In T. Grandin (Ed.), *Improving animal welfare: A practical approach* (pp. 88-114). Wallingford, UK: CABI.

References

van Grevenhof, E. M., Heuven, H. C. M., van Weeren, P. R., & Bijma P. (2012). The relationship between growth and osteochondrosis in specific joints in pigs *Livestock Science*, 143: 85-90 .

von Keyserlingk, M. A. G., Rushen, J., de Passillé, A. M., & Weary, D. M. (2009). The welfare of dairy cattle – key concepts and the role of science. *Journal of Dairy Science*, 92, 4101-4111.