

Module 10

Livestock Welfare Assessment (Part 1)



Overview of welfare inputs and livestock welfare

Welfare concerns in cattle

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.

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This module will teach you

How welfare inputs can affect livestock welfare

- ✦ the farming system
- ✦ the animal's genetics
- ✦ the stockperson

The main welfare problems in

- ✦ dairy cattle
- ✦ dairy calves
- ✦ beef cattle

Review: welfare inputs

**WELFARE
INPUTS**

Management



Environment



Animal

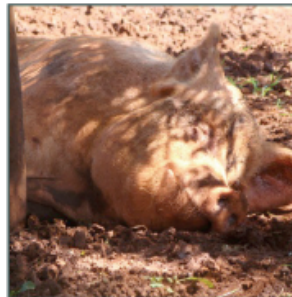


WELFARE OUTPUTS

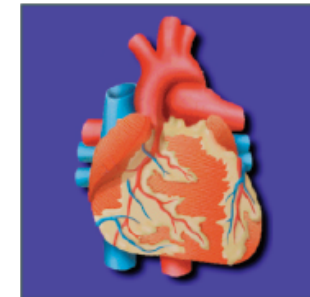
Clinical health;
production



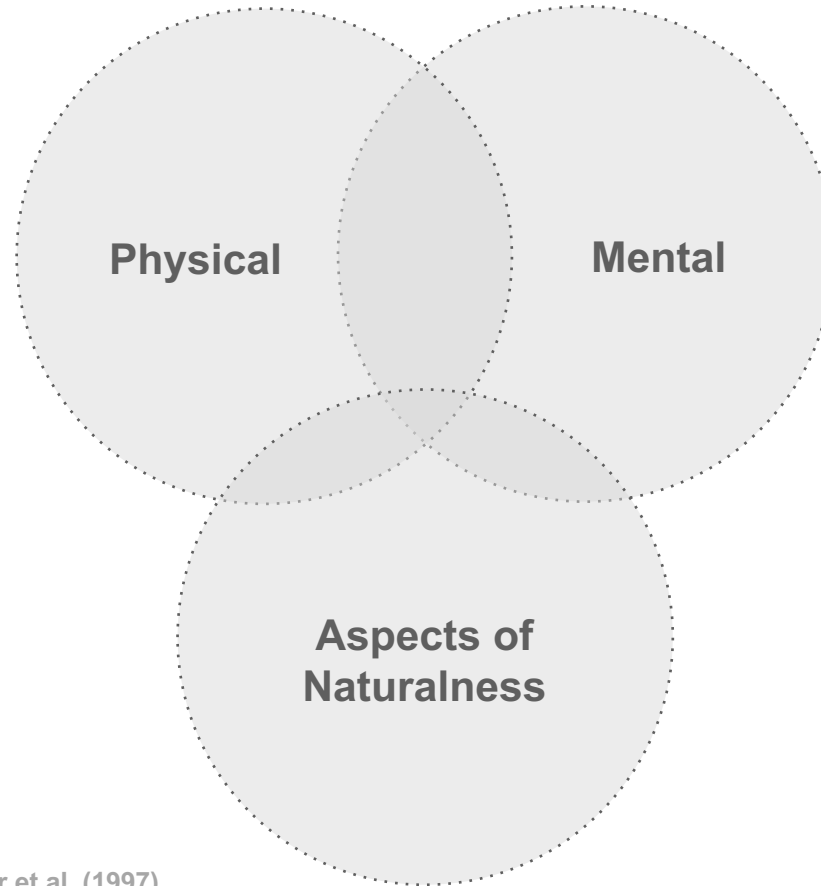
Behaviour



Physiology



Three approaches when considering animal welfare



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

The welfare potential of farming systems

Husbandry, eg

- ⌘ Housing
- ⌘ Feeding
- ⌘ Routine procedures that may cause pain

Genetics

Stockmanship

Types of farming system (FAO, 2011)

Industrialised

Intensive, i.e. high input, high output

Less intensive

Smaller scale/subsistence farming +/- irrigation

Mixed crop–livestock, e.g. rice and livestock in Latin America and South Asia

Pastoralist and agro-pastoralist, e.g. Africa

Urban livestock, e.g. South Asia

Backyard rural livestock, e.g. one or two chickens
per household

Types of farming system

May reflect economic pressures

Pressure for cheap food ⇒ small profit margins

- ⌘ Fast growth/production rates
- ⌘ High stocking densities/group sizes
- ⌘ Painful procedures (e.g. beak-trimming)
- ⌘ Insufficient monitoring
- ⌘ Inadequate vet care



Types of farming system

Other economic pressures

Subsidy bias

Farmer's own resources:

- ❖ Climate/natural disasters
- ❖ Disease outbreaks
- ❖ Armed conflict and loss of infrastructure
- ❖ Low-income countries, e.g. 766 million rural livestock-keepers living on less than US \$2 per day (FAO, 2011)



Summary so far

Welfare inputs

- ⌘ Farming system – welfare potential, role of economics
- ⌘ Next: genetics; stockpersons

Genetics

Genetics affect an animal's ability to adapt to

Environmental or climatic conditions

Husbandry system/diet

Traditionally, breeding programmes emphasised production traits

Under-emphasis of health traits

(Oltenucu & Algers, 2005)

Genetics

Low-income countries

New breeds not adapted to local conditions,
e.g. lameness in Jersey cows in Kenya

(Gitau et al., 1996)

Need to preserve local gene pool

(Lebbie & Ramsay, 1999; Rege et al., 2011)

Education to avoid in-breeding

(Halimani et al., 2010)

Stockperson

Economic pressures ⇒

- ⌘ Low stockperson:animal ratio
- ⌘ Inadequate nutrition
- ⌘ Inadequate veterinary care,
eg under-dosing with dewormers
to save money⌘ lack of efficacy or resistance

Insufficient knowledge/training

- ⌘ Genetics
- ⌘ Handling
- ⌘ Biosecurity/disease control, eg vaccine storage

Welfare concerns in dairy cows



Intensive systems: dairy cows

Husbandry

- On pasture some or all of the year
- No grazing ('zero grazing')
- Cubicle systems
- Yards +/- straw

Milking

- Machines with human supervision
- Automatic milking

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

Common welfare problems in dairy cows (Webster, 2010)

Area	Criteria not being met
1. Good feeding	Animals should not suffer from prolonged hunger
2. Good housing	Animals should have comfort round resting
	Animals should have enough space to move round freely
3. Good health	Injuries (slippery floors)
	Disease 1: painful diseases such as mastitis, foot disorders Disease 2: metabolic diseases
	Pain caused by procedures (tail-docking)
4. Appropriate behaviour	Negative emotional states, e.g. loss of calf, frustration, tiredness
	Unable to express social behaviours, as appropriate to the species
	Unable to express other species-typical behaviours: no grazing, crowding/bullying
	Poor human–animal relationships – rough handling

Area 1: good feeding (Webster, 2010)

Genetic selection for high production – inherent welfare problem:

- ❖ Holstein (~18,000 litres per lactation; 50 l/day)
- ❖ On grass: can only produce 25 litres of milk per day
- ❖ Need extra energy-dense feed
- ❖ Kept inside to ensure they eat enough
- ❖ Hunger vs. full gut vs. need to lie down

Area 1: good feeding

Recombinant bovine somatotropin (rBST) (Dohoo et al., 2003a, 2003b)

- ✦ Injection every 14 days
- ✦ increase milk production by 10–15 per cent
- ✦ Increased dry matter intake by ~1.5kg/day
- ✦ Reduced body condition score
- ✦ Reduced fertility; increased risk of mastitis and lameness; injection site reactions

Oxytocin

- ✦ Increases milk letdown

Area 2: good housing

Insufficient number of cubicles

- ❖ Prolonged standing (especially heifers)

Poor cubicle design, e.g.

- ❖ Too short or narrow
- ❖ Insufficient lunging space as cows rise

Little or no bedding

- ❖ Thin cows

Dirty bedding/concrete

- ❖ Mastitis

Area 3: good health

(Gregory, 2011)

Silage feeding ❖ **wet, acid slurry**

- ❖ Slipping if concrete is smooth

High-protein feeds ❖ **high concentrations of urea in urine**

- ❖ Keratolytic ❖ claw erosion

Dirty flooring predisposes to

- ❖ Foot infections
- ❖ Mastitis

Area 3: good health – mastitis

Bacterial infection

Predisposing factors, e.g. genetics, cortisol at parturition, udder hygiene, rBST

Tail-docking (von Keyserlingk et al., 2009)

Painful

Does not improve udder hygiene or health

Robotic milking

Increases risk of mastitis, e.g. inadequate hygiene (Hovinen & Pyörälä, 2011)

Area 3: good health – lameness

Foot disorders – infections

- ✦ Eg sole ulcer, digital dermatitis
- ✦ Multiple causes, e.g. genetics, husbandry
- ✦ Pain
- ✦ Reduced milk yield and fertility

Lack of recognition by farmers (Leach et al., 2010)

- ✦ Prevalence ~36 per cent, but farmers did not perceive the welfare or financial costs of it
- ✦ ‘Bad’ becomes normal - farmers overworked and have no point of comparison

Area 4: appropriate behaviour

Negative emotions

Pain – lameness

Exhaustion

⌘ Underlying metabolic cause: genetics or cheap food

Fear – bullying, rough handling

- Eg fear of handler reduces residual milk letdown

⌘ Distress at separation from calf

When you visit a dairy farm

What are the problems?

- ❖ Welfare outputs – lameness, dirty legs or udder, lying behaviour, etc.
- ❖ Why is it occurring – welfare inputs?
- ❖ Are the problems inherent or avoidable?

Inform the farmer/owner

Support him/her in making changes

Welfare of dairy calves



Common welfare problems in dairy calves

Area 1: good feeding

- ❖ Hunger (von Keyserlingk et al., 2009)
- ❖ Malnutrition – milk-fed veal

Area 2: good housing

- ❖ Lack of space (crates)



Credit: Kekker Dier

Common welfare problems in dairy calves

Area 3: good health

Enteric and respiratory disease –
markets/mixing/ transport

Painful procedures: castration, disbudding,
tail-docking, branding

- ❖ Pain pathway: noxious stimulus, detected by nociceptors, transmitted by nerves to spinal cord and then to the forebrain
- ❖ Local anaesthesia and NSAIDs



Common welfare problems in dairy calves

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

- ✦ **Castration: rubber ring with local anaesthesia**
- ✦ **Disbudding: thermal or chemical cautery with local anaesthesia**
Avoid amputating horns in older animals
- ✦ **Tail-docking**
- ✦ **Branding: freeze branding better than hot**
- ✦ **Ear tags**
- ✦ **Nose rings**

Common welfare problems in dairy calves

Area 4: appropriate behaviour

Negative emotional states, eg

- ❖ Anxiety from early separation from cow (Flower & Weary, 2003)
- ❖ Frustration from social isolation or inability to suckle
- ❖ Mixing at markets

Inability to express species-typical behaviours (Widowski, 2010)

- ❖ No suckling (❖ cross-suckling other calves)
- ❖ No grazing/eating roughage (⇒ tongue-playing)

Human–animal relationships

- ❖ Rough handling

When you visit a beef farm

What are the problems with the calves?

- ❖ Welfare outputs – e.g. enteric or respiratory signs?
Cross-suckling? Painful procedures?
- ❖ Why is it occurring – welfare inputs?
- ❖ Are the problems inherent or avoidable?

Inform the farmer/owner

Support him/her in making changes

Welfare of beef cattle



Intensive systems: beef cattle

On pasture some or all of the year

Feedlots

No grazing ('zero grazing')

High concentrate

Use of growth promoters

Large yards or pens

- ⌘ Outdoors
- ⌘ Slatted floors +/- bedding



Common welfare problems in beef animals (intensive)

Area 1: good feeding

- ⌘ (Hunger?)

Area 2: good housing

- ⌘ Crowding
- ⌘ Inadequate lying area
- ⌘ Lack of shade

Area 3: good health

- ⌘ Respiratory disease (*Mycoplasma bovis*) (Caswell et al., 2010)
- ⌘ β -agonist growth promoters (zilpaterol, ractopamine) \Rightarrow lameness, heat stress, muscle weakness (Grandin, 2010)

Common welfare problems in beef animals (intensive)

Area 3: good health (cont.)

- ✦ **Painful procedures (1): castration, branding, disbudding**
- ✦ **Painful procedures (2): transvaginal spaying of heifers (Pinner, 2006)**
- ✦ **Dystocia in dairy cows crossed with large beef breeds, eg Belgian Blue**

Common welfare problems in beef animals (intensive)

Area 4: appropriate behaviour

- ❖ **Negative emotional states, eg fear, frustration (crowding/bullying, mixing)**
- ❖ **Expression of other species-typical behaviours – no grazing**
- ❖ **Human–animal relationships – rough handling**

Common welfare problems in beef animals (extensive) (Petherick, 2005)

Area 1: good feeding

- ❖ Prolonged hunger
- ❖ Prolonged thirst

❖ Area 2: good housing

- ❖ Environmental temperature

❖ Area 3: good health: absence of

- ❖ Injuries /death – predators
- ❖ Disease
- ❖ Pain caused by procedures, eg late castration

Area 4: appropriate behaviour

- ❖ Good human–animal relationships

Summary

How welfare inputs can affect livestock welfare

The main welfare problems in cattle, eg

- ✦ Exhaustion in dairy cows
- ✦ Painful diseases
- ✦ Inability of calves to suckle
- ✦ Painful procedures
- ✦ Fear of people caused by rough handling

Four-point welfare framework

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

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?

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