

Introduction to Welfare Quality and animal based welfare outcomes

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Research areas



ANIMAL PRODUCTION

ANIMAL BREEDING & GENETICS

- Poultry Breeding
- Rabbit Breeding
- Pig Breeding & Genetics

ANIMAL NUTRITION, HEALTH & WELFARE

- Animal Welfare
- Ruminants
- Monogastrics Nutrition

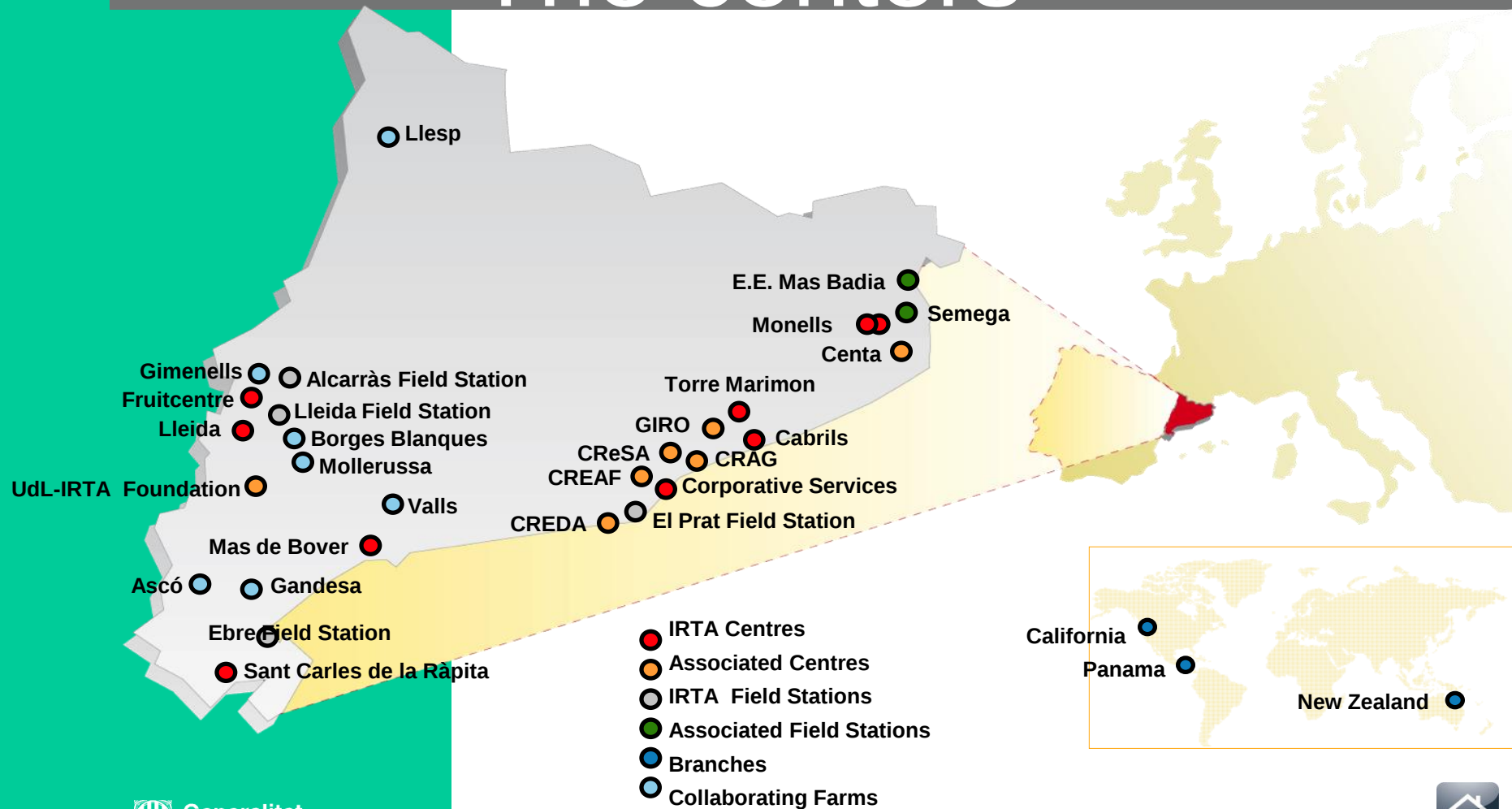
AQUACULTURE

- Marine Monitoring
- Aquatic Cultures



Research lines

- 1. Animal Welfare at slaughter**
2. Animal Welfare during transport.
3. Development of animal welfare assessment systems on farm and at slaughter.
4. Evaluation of alternatives to painful management procedures (dehorning and castration).



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RECERCA | I | TECNOLOGIA

AGROALIMENTÀRIES





CONTENT

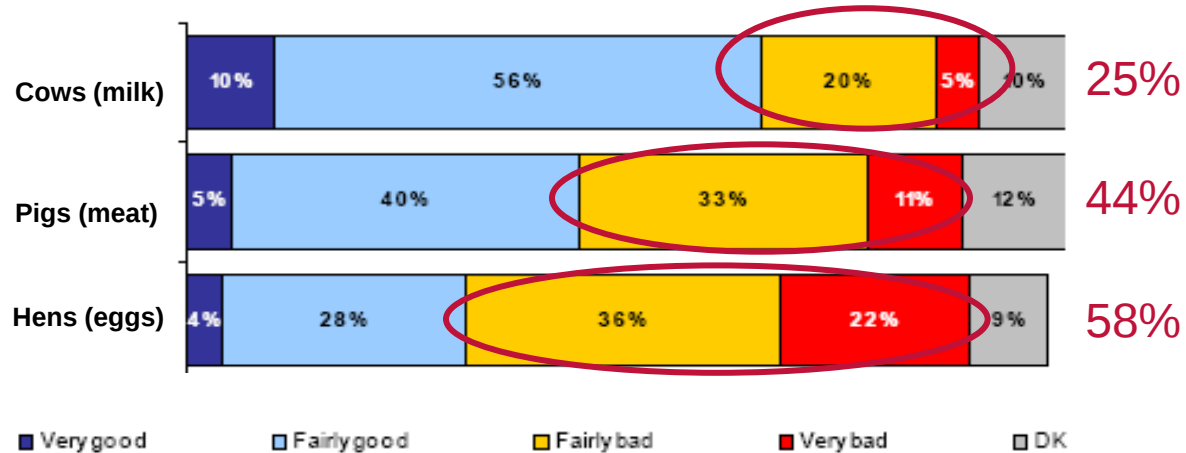
- 1. Public concern**
- 2. Welfare assessment protocol**
- 3. Welfare implementation**



CONTENT

- 1. Public concern**
2. Welfare assessment protocol
3. Welfare implementation

Public concern



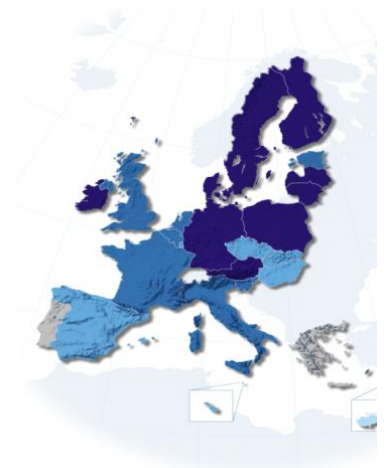
EU Commission Special Eurobarometer:
Attitudes of consumers towards the welfare of
farmed animals (2005)

**Animal welfare is an important attribute of an overall
'food quality concept'**

Who has to take the responsibility ?

1. The government by law

- Animals are defined as sentient creatures and no longer just as agricultural products (Treaty of Amsterdam, 1997).
- Legislation on farm animals, transport and slaughter.



On Farm

- 01/01/2003: Ban the construction of new stalls installations
- 01/01/2006: Ban the use of tethers for sows and gilts
- 01/01/2013: Ban the use of individual stalls

EU Legislation

COUNCIL DIRECTIVE 2001/88/EC of 23 October 2001

Most important aspects:

- Ban the use of individual stalls for pregnant sows
- Increase the living space
- Improve the quality of the flooring surfaces
- Allow permanent access to materials for rooting
- Introduce higher level of training and competence on welfare issues for the stockmen and the personnel in charge of the animals

EU Legislation

COMMISSION DIRECTIVE 2001/93/EC of 9 November 2001

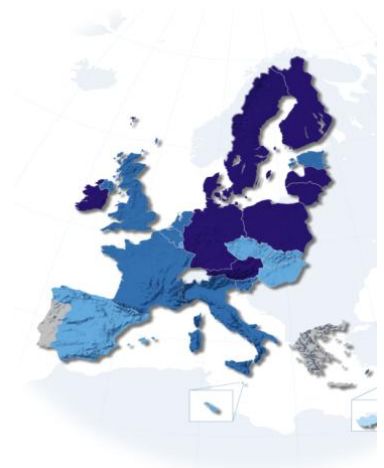
Most important technical aspects:

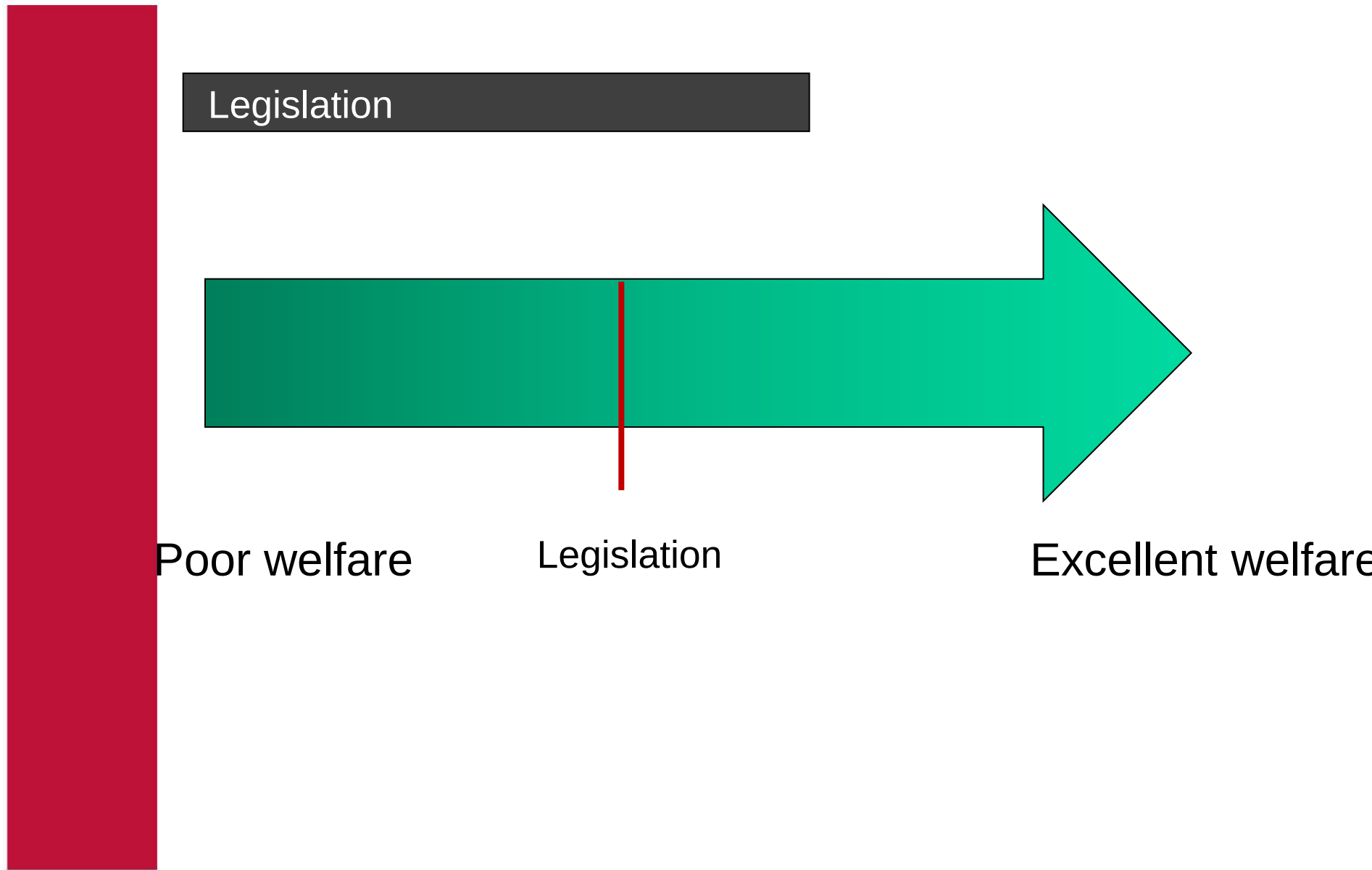
- Light requirements and maximum noise levels.
- Permanent access to materials for rooting and playing.
- Permanent access to fresh water.
- Additional restrictive conditions to carry out mutilations on pigs.
- Minimum weaning age of four weeks.

Who has to take the responsibility ?

1. The government by law

- Animals are defined as sentient creatures and no longer just as agricultural products (Treaty of Amsterdam, 1997).
- Legislation on farm animals, transport and slaughter.
- CAP reform
- International development (OIE)





Legislation

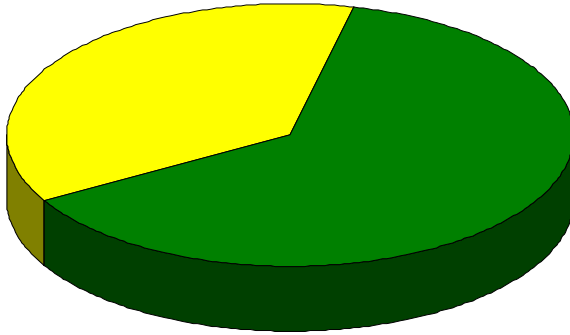
Poor welfare

Legislation

Excellent welfare

Who has to take the responsibility ?

1. The government by law
2. **Consumer choice**



Survey of 29.152
European citizens
(25 countries)



**63 % would change shopping place to buy
animal welfare friendly products**

Eurobarometer (2007) Attitudes of EU citizens towards animal welfare.
Brussels: European

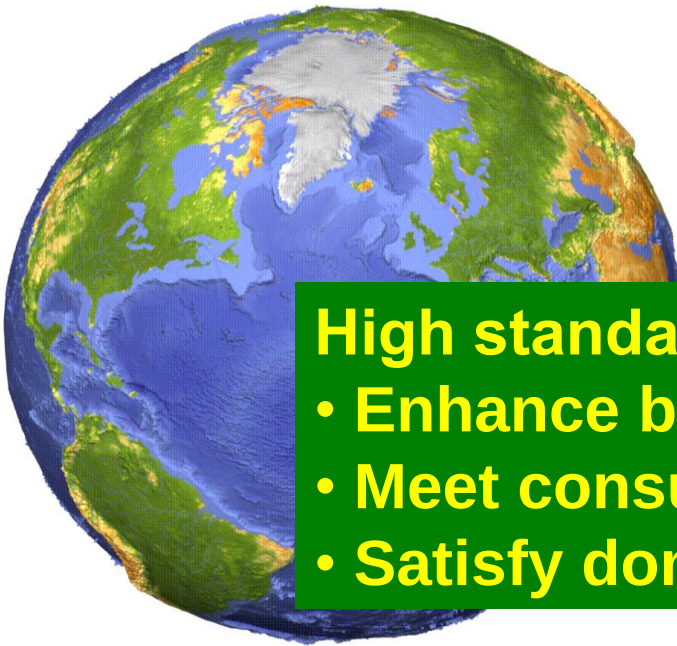
Market requirement

- **Producers:** are willing to improve A. W. but they are worried about ...
 - Lack of information to the consumers
 - Reticence to pay higher prices
 - Imports

Consumer Choice

The International Financing Corporation

**has recognised animal welfare as
an important element of
commercial livestock operations
around the world**



High standard on animal welfare...

- Enhance business efficiency**
- Meet consumer expectation**
- Satisfy domestic and international markets**

Consumer choice

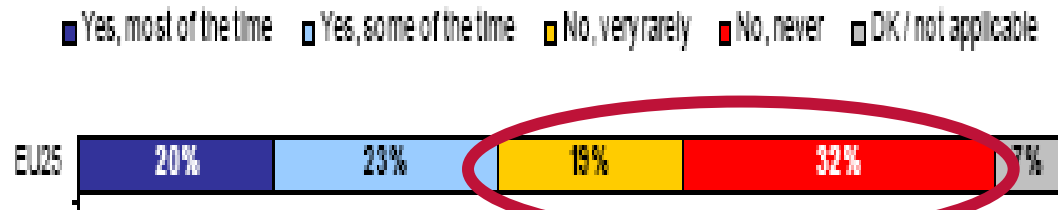
Barriers to consumption 'animal friendly' products

Mean scores for importance
(1=most important)

■ information	2.28
■ availability	2.53
■ influence	3.25
■ disassociation	3.37
■ cost	3.55

EU FAIR 98-3678 'Consumer concern about farm animal welfare and food choice' (2002)

When purchasing eggs, meat or milk can you easily identify from the label those products sourced from animal welfare friendly production systems?



51%

EU Commission Special Eurobarometer:
Attitudes of consumers towards the welfare
of farmed animals (2005)

EU Action Plan (2006-2010)

Five areas of action:

- Upgrading standards and secure enforcement
- Developing Research
- Introducing standardised animal welfare indicators
- Informing and promoting AW (labelling and communication strategies)
- Supporting international initiatives (OIE..)



CONTENT

1. Public concern
2. **Welfare assessment protocol**
3. Welfare implementation

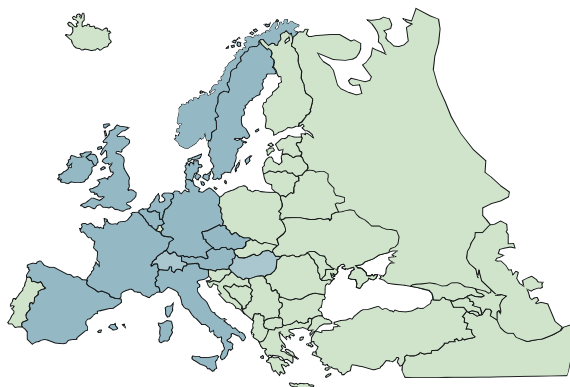
Welfare Quality project



EU integrated project Food-CT-2004-506508

- 44 partners
- 13 European countries
- 4 Latin American countries

www.welfarequality.net



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graph BT; A[Approach] --> B[Improved animal welfare in Europe]; B --> C[Improve housing and management on farm and during transport and slaughter]; C --> D[Practical strategies];
```

Approach

Improved animal welfare in Europe

Improve housing and management on farm and during transport and slaughter

Practical strategies

Practical strategies



1. Minimizing handling stress (stockmanship)
2. Genetic solutions to welfare problems
3. Eliminating injurious behaviours
(tail biting in pigs, feather pecking in poultry)



1. Reducing lameness in cattle and broilers
2. Minimizing neonatal mortality in pigs
3. Alleviating social stress



Aims

Improved animal welfare in Europe

Improve housing and management on farm and during transport and slaughter

Connect animal welfare to informed consumer choices

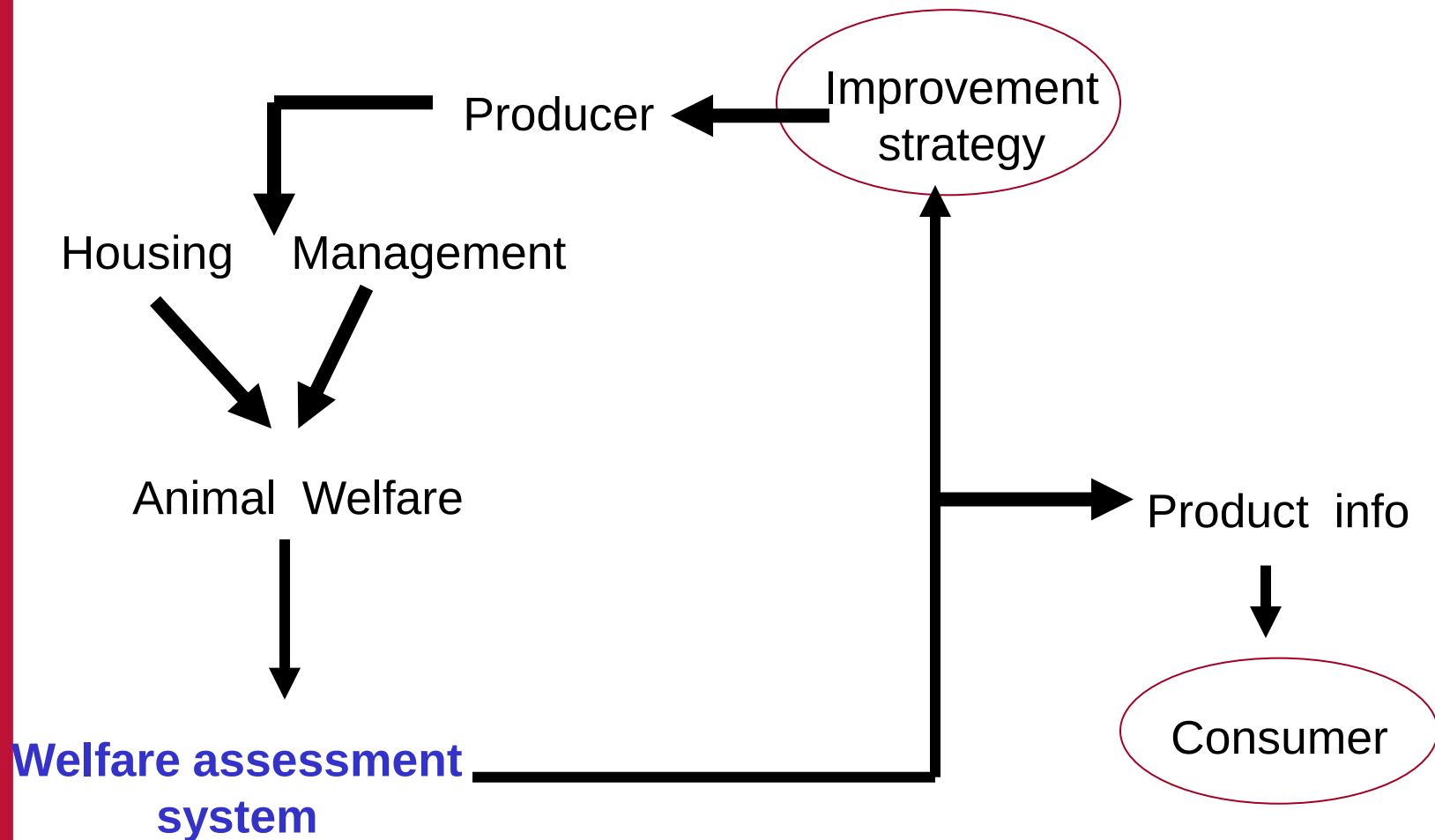
High EU welfare standards and protection against low standard imports

Product information

Welfare monitoring

Developing a monitoring system to assess welfare quality in cattle, pigs and chickens

Approach



AW as a multidimensional concept

Consensus on animal welfare being a multidimensional concept

e.g. Five freedoms (FAWC 1992)

1. Freedom from hunger and thirst
2. Freedom from discomfort
3. Freedom from pain, injury and disease
4. Freedom to express normal behaviour
5. Freedom from fear and distress

Consequences for the assessment of welfare

- There is no unique measure of animal welfare
Each aspect of welfare needs to be checked
- What is the relative importance of each aspect?
Can there be compensations between aspects???

Requirements for a list of criteria

We need to define a list of criteria fulfilling theoretical and practical requirements:

- The list must be **exhaustive**, i.e. containing every important aspect;
- The list must be **minimal**, i.e. containing only necessary criteria (banning redundant or irrelevant criteria);
- Criteria must be **independent** of each other. The interpretation from one criterion shall not depend on that from another criterion. To avoid double counting there should be no functional links between criteria;
- The list of criteria should be **agreed** by all stakeholders and considered as a sound basis for operating a practical assessment;
- To be '**legible**' the list of criteria should be composed of a limited number of criteria.

Animal welfare assessment system

4 PRINCIPLES

12 CRITERIA

MEASURES

Good Feeding	1. Absence of prolonged hunger	
	2. Absence of prolonged thirst	
Good Housing	3. Comfort around resting	
	4. Thermal Comfort	
	5. Ease of movement	
Good Health	6. Absence of injuries	
	7. Absence of disease	
	8. Absence of pain induced by management procedures	
Appropriate Behaviour	9. Expression of social behaviours	
	10. Expression of other behaviours	
	11. Good Human- Animal relationship	
	12. Positive emotional state	

Measures

- AW measures must cover all criteria of welfare.
- There is no AW measure that can be used on its own.
- Three types of measures:
 - animal based
 - management based
 - resource based

General principles:

- *Environment or resource based indicators vs. Animal based*

ENVIRONMENTAL- BASED PARAMETERS

- Density
- Feeding, drinking space
- Temperature
- Type of floor. Etc.

MANAGEMENT-BASED PARAMETERS

- Euthanasia criteria
- Castration procedures
- Hygiene
- Management of sick animals. Etc.

ANIMAL-BASED PARAMETERS

- Wounds
- Tail biting
- Body Condition
- Social behaviours.
- Bursitis.
- Panting; Shivering.

Animal welfare measures

Criteria	Resource-based	Animal-based
Thermal comfort	Temperature Ventilation	Shivering, panting, huddling
Ease of movement	Ramp	Slipping, falling
Positive emotional state	Light, noise	Reluctant to move, turning back



Measures

Measures on resources & management

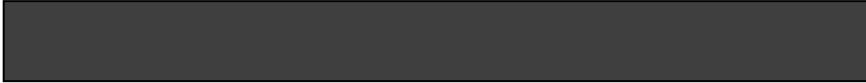
Measures taken into account to diagnose causes of poor welfare and advice farmers/transport drivers on ways to improve animal welfare

Measures on animals: health, behaviour...

Measures to be preferred to assess animal welfare state

Animal based measures

- Animal based measures $\neq$ behaviour
- Clinical measures
- "Indications" of behaviour

- 
- 
- Management and resource based measures are also used
 - As a complement and in their own right

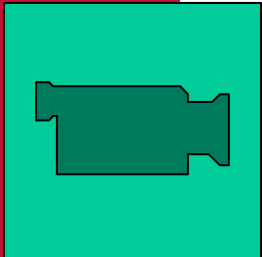
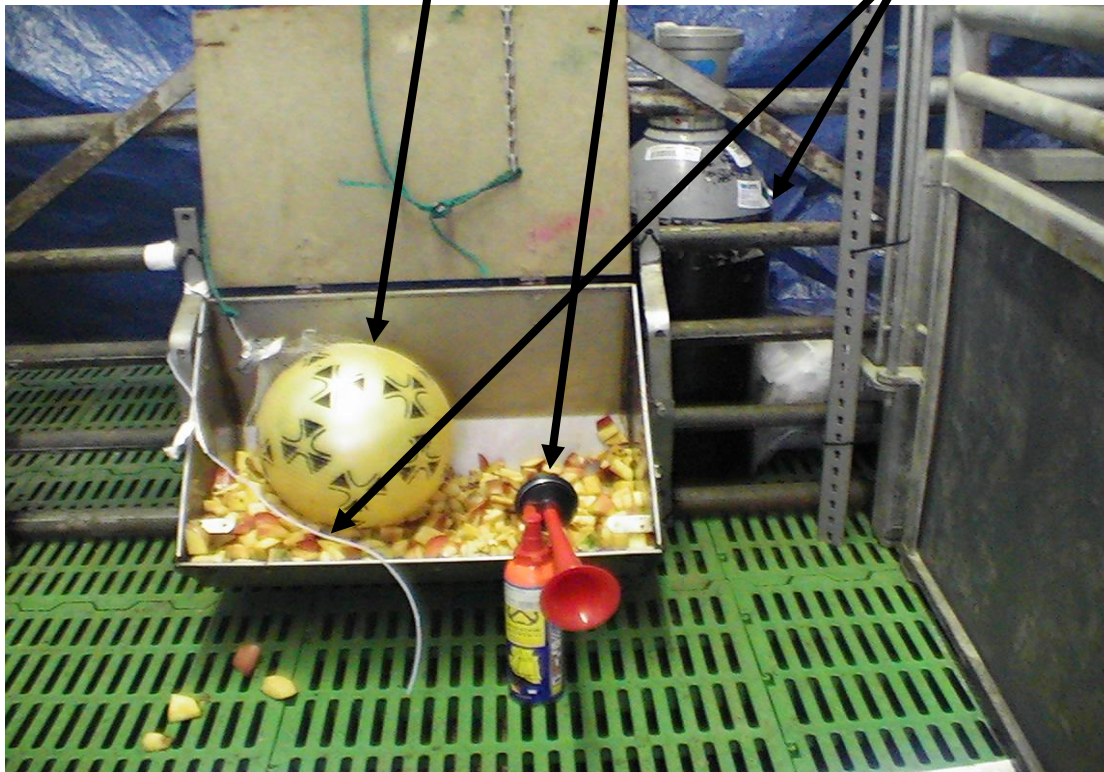
General principles:

- Be valid
 - Concurrent validity (comparison with validated measures)
 - Predictive validity (effects of treatments)



General fear

1. 32 post-weaning pigs (35 kg) and 32 finishing pigs (100 kg).
2. A trough in a test pen with apples in pieces.
3. Three novel stimulus (visual, auditory and olfactory).



General principles:

- Be valid
 - Concurrent validity (comparison with validated measures)
 - Predictive validity (effects of treatments)
 - Consensus between experts
- Be reliable: different observers record the same data (objective: inter-observers correlation > 0.65)
- Be feasible on farms / at slaughter
requires limited amounts of animal handling, time, cost, skills,...



AW monitoring system

PIGS

- Sows and piglets (breeding herd)
- Growing pigs (finisher herd)
- Pigs at slaughter

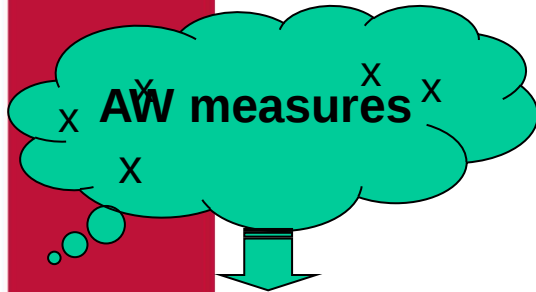
CATTLE

- Dairy cows
- Beef cattle (+ welfare at slaughter)
- Veal calves [dairy calves & heifers]

POULTRY

- Meat chicken
- Laying hen

Validation of the AW assessment system



SENSITIVITY

FEASABILITY



- 1) Gather data on AW assessment systems from a large and representative sample of farms and slaughterhouses around Europe
- 2) Use epidemiological and other statistical modelling techniques to refine the number and types of measures:
 - Identification of risk factors
 - Calibration of simplified versions



But before the assessment of the protocol.

Standardisation of the measures

- Scope
- Sampling size and sampling strategy
- Method description (order of the measures)
- Classification (scoring system)

Sows and piglets (breeding herd)

45 farms in the Netherlands (Indoors)

27 farms in UK

15 Indoors

12 outdoors (2 organic)

- Wide variety of farming systems:
 - Outdoors - Indoors
 - Organic - Conventional
 - Deep-straw – Fully-slatted
 - Stalls – Group housing

Growing pigs

On farm

30 farms in France (Indoors)

7 on-straw

23 on concrete/slatted floor

41 farms in Spain

30 Indoors on concrete/slatted floor 11 outdoors

At slaughter

11 Abattoirs in Spain

10 finishing pigs and

1 Sows

Animal welfare assessment systems

PRINCIPLE	CRITERIA		measures
Good Feeding	1	Absence of prolonged hunger	Body condition score
			Feeding management
	2	Absence of prolonged thirst	Water supply
Good Housing	3	Comfort around resting	Pressure injuries
			Absence of manure on the body
	4	Thermal comfort	animals shivering, panting, huddling behaviour
			Environmental temperature
	5	Ease of movement	Total pen space and stocking density

Good health	6	Absence of injuries	Wounds, Lameness
			Tail biting
	7	Absence of disease	Respiratory problems
			Enteric problems
			Skin condition
			Ruptures/hernias
			Health management strategy
			Management of sick animals
			Criteria for euthanasia
			Hygiene/cleaning routine
	8	Absence of pain induced by management procedures	Mutilation (castration, tail docking)
Appropriate behaviour	9	Expression of social behaviours	Positive and Negative social behaviours
	10	Expression of other behaviours	Qualitative assessment
			Exploratory behaviour
			Environmental enrichment
	11	Good human-animal relationship	Fear of humans

Welfare assessment

- **Farmer interview (management-based measures)**

Overview of the protocol

Health management

Hygiene management

Record keeping

Mutilation routine

Euthanasia criteria

Sow, farrowing & piglet management

Welfare assessment

- Farmer interview (management-based measures)
- **Animal-based measures:**
 - Respiratory problems
 - Qualitative behaviour assessment
 - Behaviour
 - Thermoregulatory measures
 - Human-animal relationship
 - Clinical measures, health measures, lameness, pressure injuries

Animal-based measures

Sows:

- 30 pregnant sows (early, mid- & late pregnancy)
- 10 lactating sows and their litters

INDIVIDUAL level



Growing pigs:

150 of 10 pens / farm

PEN level



3 POINT SCALE

0
Good welfare

1

2
Poor welfare

Order of the measures

- Farmer interview (management-based measures)
- Animal-based measures:
 - Respiratory problems
 - Qualitative behaviour assessment
 - Behaviour
 - Thermoregulatory measures
 - Human-animal relationship
 - Clinical measures, health measures, lameness, pressure injuries
- **Resource-based measures**

Resource -based measures

- Pen cleanliness
- Stocking density
- Floor type
- Feeder type and number
- Drinker type and number
- Temperature
- Bedding
- Environmental enrichment
- Hospital pen

At slaughter

Information collected	Sample size	Place	Time required
Slipping	2 lorries	Unloading	3.0 hours
Falling			
Reluctance to move	2 lorries	Unloading	
Turning back			
Shivering	6 lorries	Unloading/from unloading to lairage	
Panting			
Sick animals			
Dead animals			
Space allowance in lorries			
Bedding of lorries			
Lameness	2 lorries	From unloading to lairage	
Huddling	8 pens	Lairage	0.75 hours
Shivering			
Panting			
Space allowance in lairage pens			
Flooring of lairage pens			
Dead animals			
Water supply			
Food provision			
High pitched vocalizations	Group level	From lairage to stunning	0.25 hours
Stunning effectiveness	60 animals, divided into 3 batches of 20 with time break in between	Stunning area	0.50 hours
Wounds on body	60 samples divided into 3 batches of 20 with time break in between	After slaughter	1.0 hours
Pneumonia ¹			
Pleurisy ¹			
Pericarditis ¹			
White spots on liver ¹			

Total time 5.5 hours

Clear indicator of welfare problems:

- Death: breathing, heart beat, corneal reflex
- Sickness: Animals unable to walk

Resource -based measures

- Unloading and waiting area
- Use of electric prods
- Showers during lairage
- Risk of injuries due to the facilities
- Emergency pens
- Stunning system

Time required.....

- **5-7 h**
- Interview: 40 min (20-60min)
- Visit: 4-6 h
- Duration depends on:
The experience and skills of the assessor

On Farm:

- Interest of the farmer
- Size of the farm and distance
- Nr of rooms
- Nr of animals per pen
- Behaviour (frightened animals)
- Dirtiness
- Light intensity

At Slaughter:

- Frequency of truck arrivals
- Time between unloading and the beginning of the slaughtering

Acceptability and feasibility

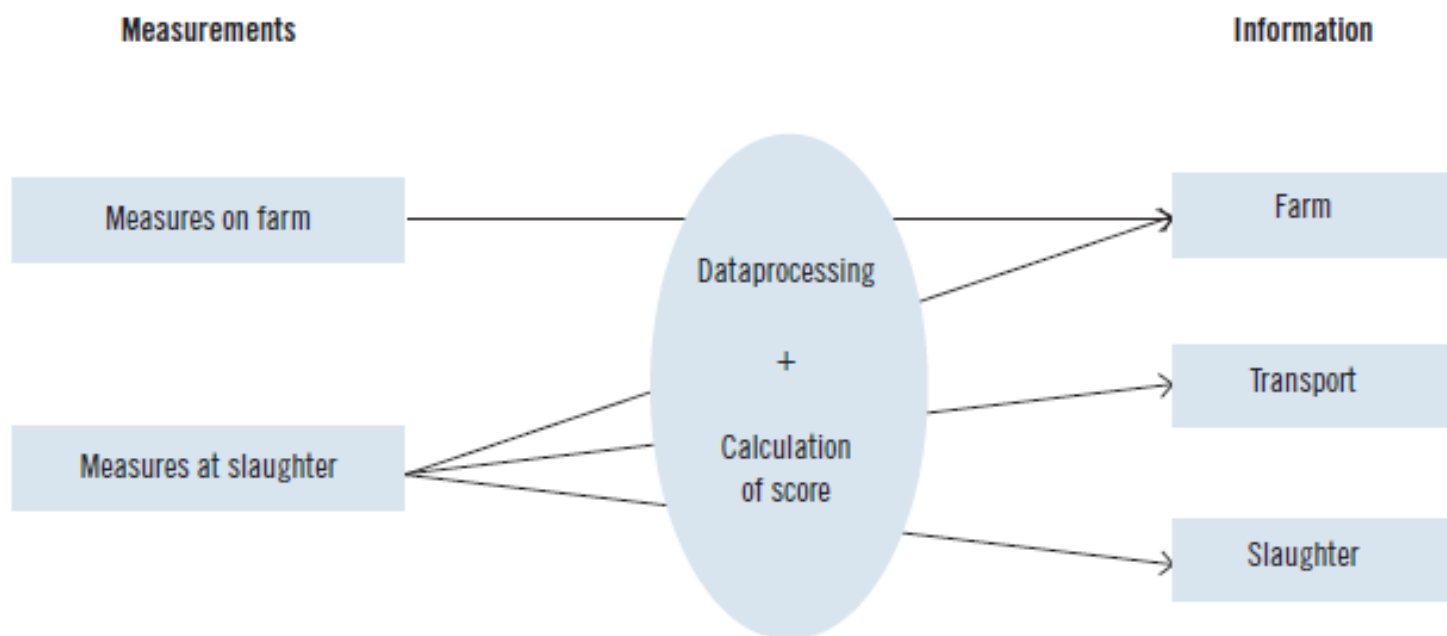
Positive response from the farmer participants

- Little input on their part
- None of the measures are invasive or involve moving pigs/sows in/out of pens.

Feasibility

- The protocol works well
- System design affects practicality of some measures
 - Large pens (behaviour)
 - Large group
 - Outdoor farms

Sources of information





CONTENT

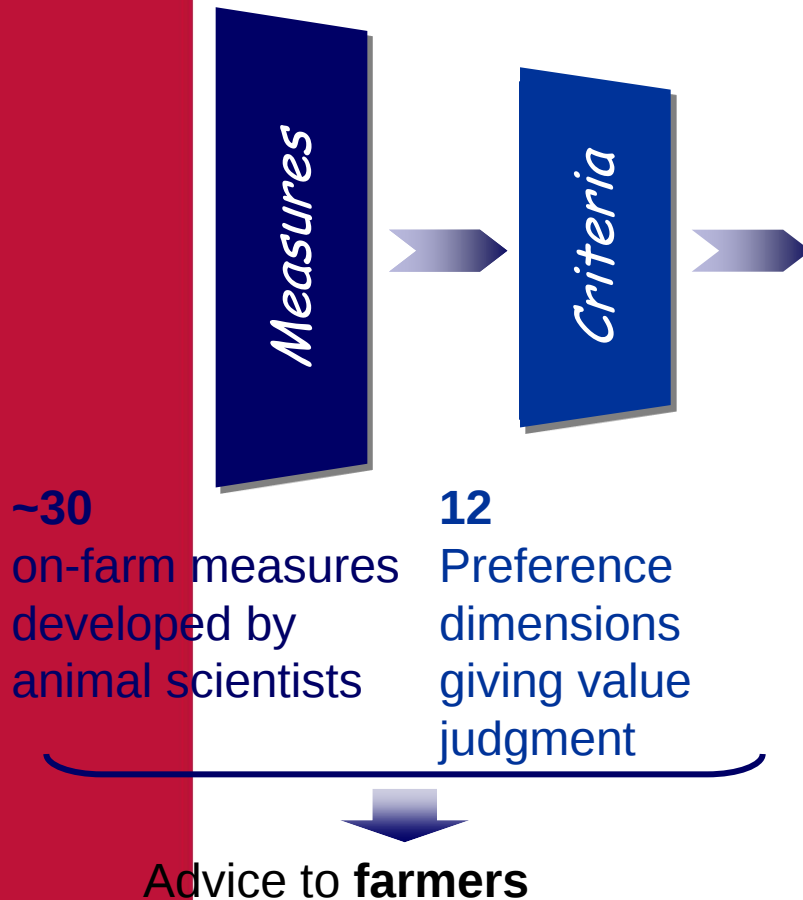
1. Public concern
2. Scientific framework to assess welfare
3. **Welfare implementation**



Welfare implementation

1. Research tool
2. To provide advice and support to farmer
3. Product information system

Product information system



4 Principles	12 Welfare criteria
Good feeding	Absence of prolonged hunger
	Absence of prolonged thirst
Good housing	Comfort around resting
	Thermal comfort
	Ease of movement
Good health	Absence of injuries
	Absence of disease
	Absence of pain induced by management procedures
Appropriate behaviour	Expression of social behaviours
	Expression of other behaviours
	Good human-animal relationship
	Positive emotional state

Improvement strategies

- **Installations:**
design, construction and maintenance.
- **Management:**
Husbandry practices, transport
procedure, distances,.
- **Genetic:**
Selection.
- **Quality of handling:**
Attitude and knowledge of the personnel

“The human factor”

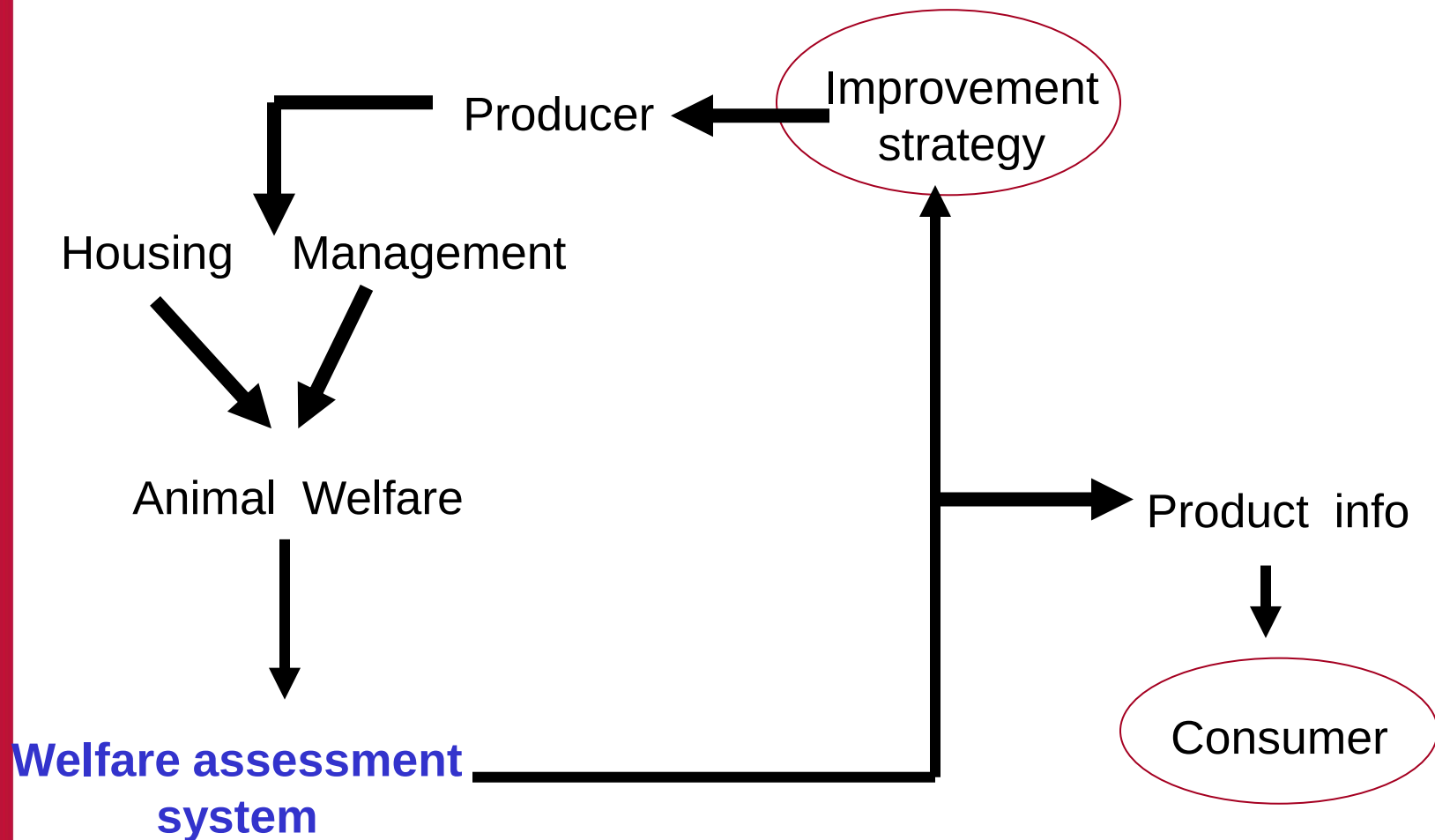
- **Poor stockmanship may cause chronic fear**
- **It may also lead to poor supervision of the animals
(eg low detection rate of lameness in dairy cows)...**
- **And to husbandry practices that are not necessary
or acceptable**

“The human factor”

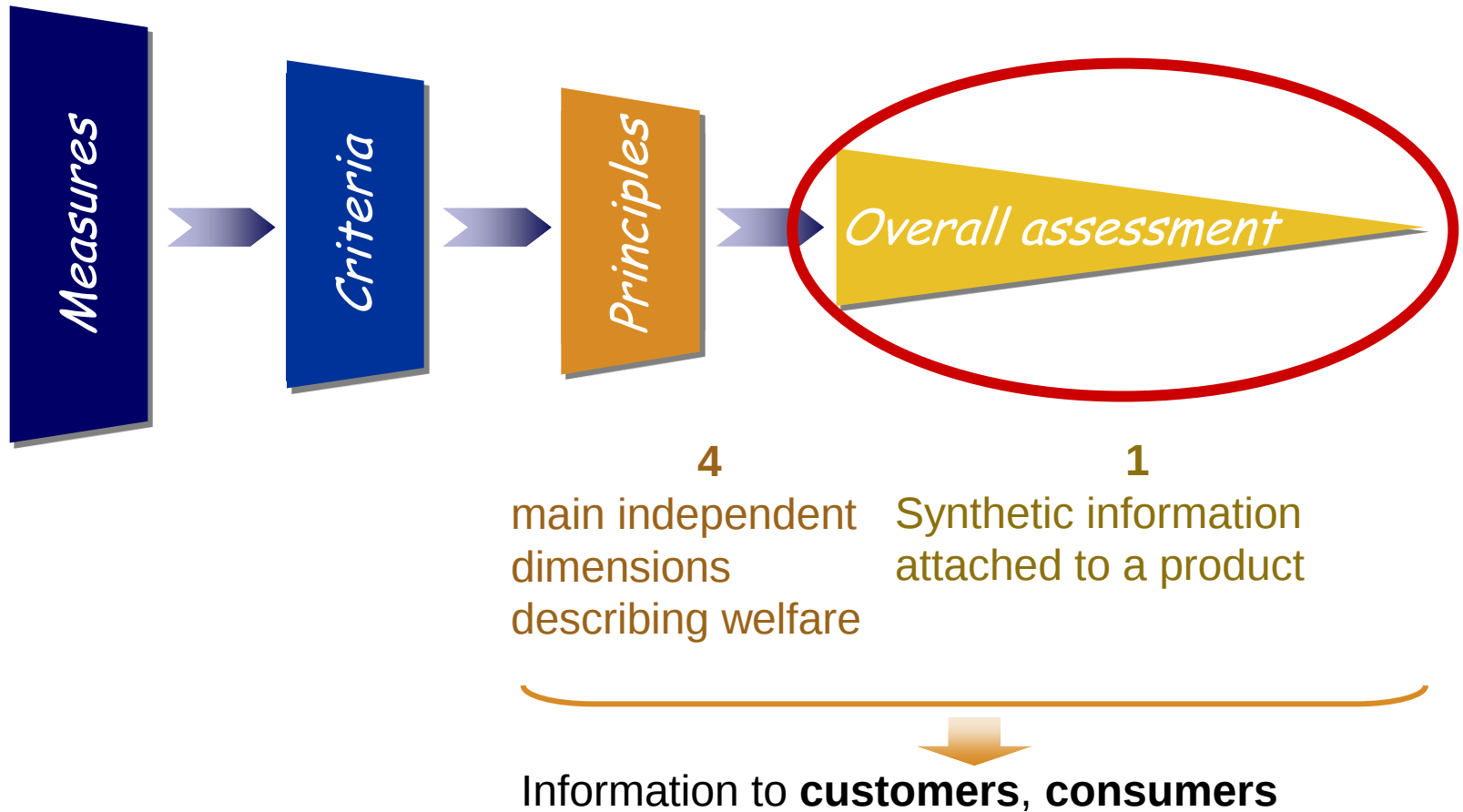
- **Training the stockpeople and the veterinarians is probably the most cost-effective strategy to improve animal welfare**
- **Without specific training on animal welfare, veterinarians and animal scientists may miss some important aspects of it**
- **Treatment of pain remains a major issue**

(eg Hewson et al., 2007)

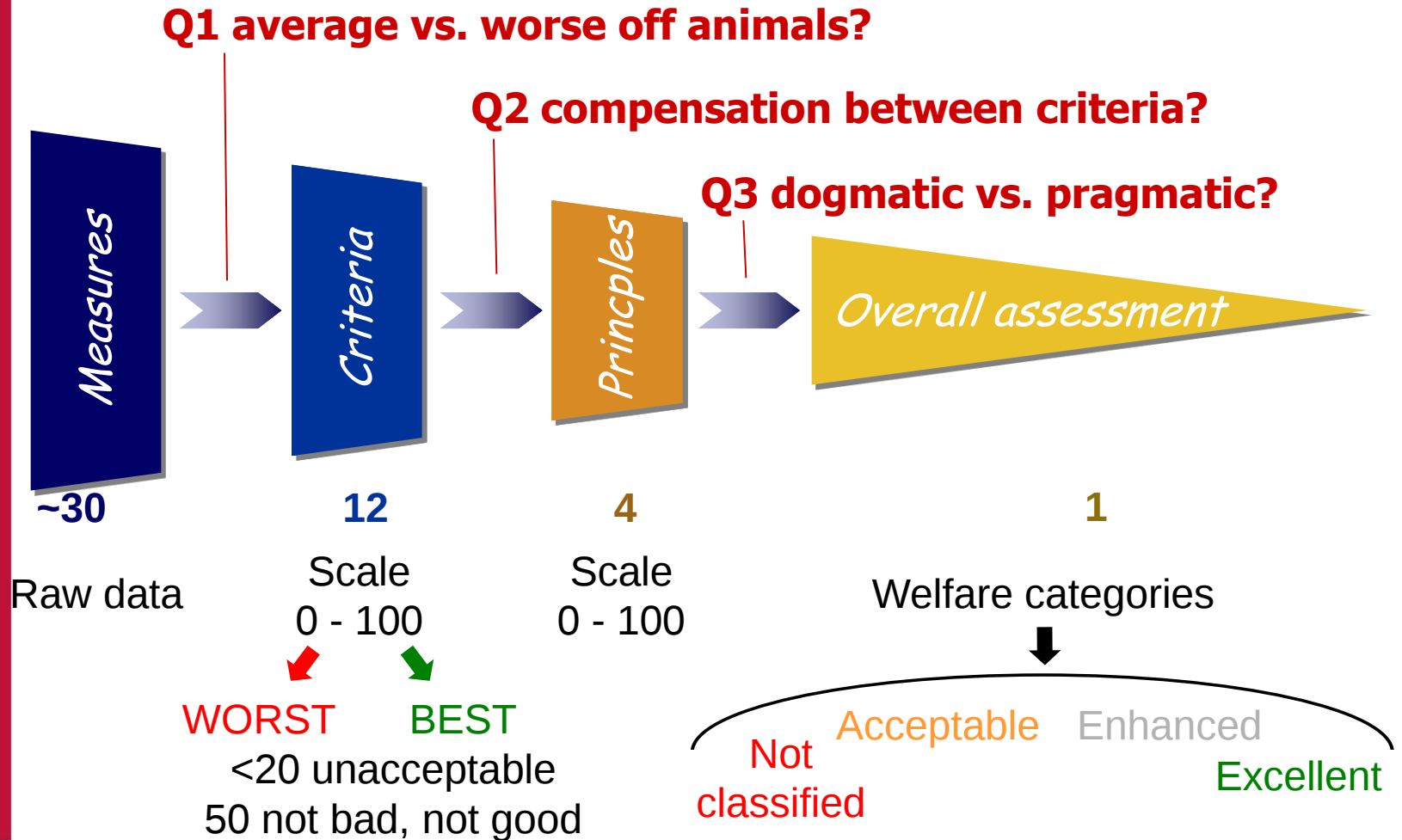
Approach

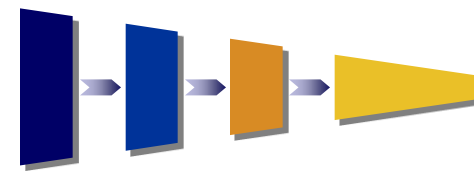


Product information system



Sequential evaluation structure





From measures to criteria

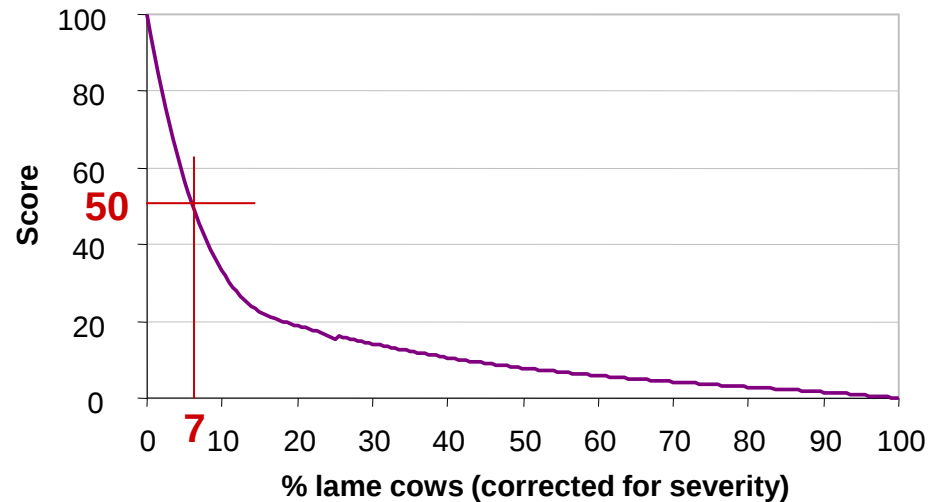
Q1 average vs. worse off animals?

Experts consulted: animal scientists who developed the measures

Criteria: absence of injuries

Measure: % lame cows

Expert opinion is used to transform raw data into scores that express compliance with welfare criteria

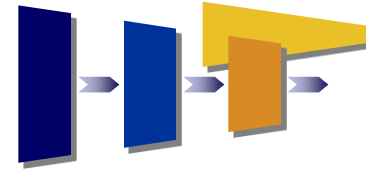


→ The worse off animals are given priority

→ Overall welfare is also important (eg [5% severely + 50 % moderately lame animals] results in a lower score than [10% severely lame + 90% not lame]) } balance

From criteria to principles

Q2 compensation between criteria



Experts consulted: animal and social scientists

- More importance attributed *to some criteria*

Example: *principle 'Good feeding'*, composed of 2 criteria:



+



- More importance attributed *to bad scores*
(i.e. no full compensation between good and bad scores)

We use an operator that allows these two rationales Nevertheless, compensation between criteria is small

From principles to overall assessment

- Excellent

The welfare of the animals is of the highest level.

- Enhanced

The welfare of animals is good.

- Acceptable

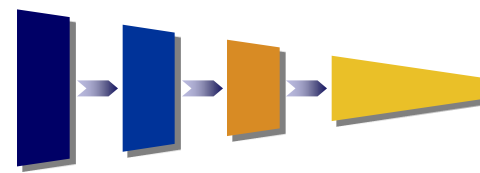
The welfare of animals is above or meets minimal requirements.

- Not classified

The welfare of animals is low and considered unacceptable

From principles to overall assessment

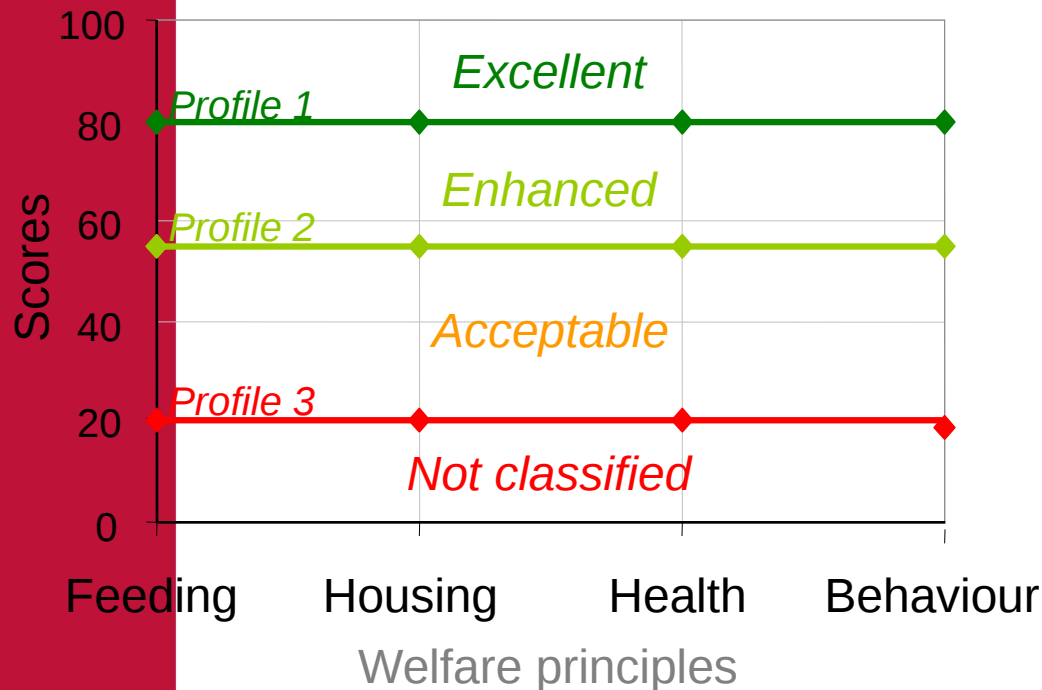
Q3 dogmatic vs. pragmatic approach?



Objective = To assign farms to ordered welfare categories

while *limiting compensations* between principles

⇒ *Comparison to pre-defined profiles* that delimit the categories



Definition of:

⇒ *reference profiles*

according to value scale

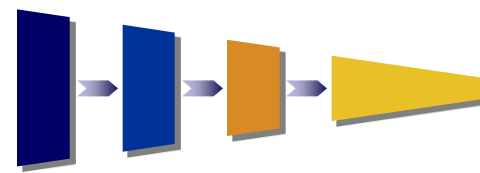
<20 unacceptable

55 just above 50

80 symmetrical to 80

From principles to overall assessment

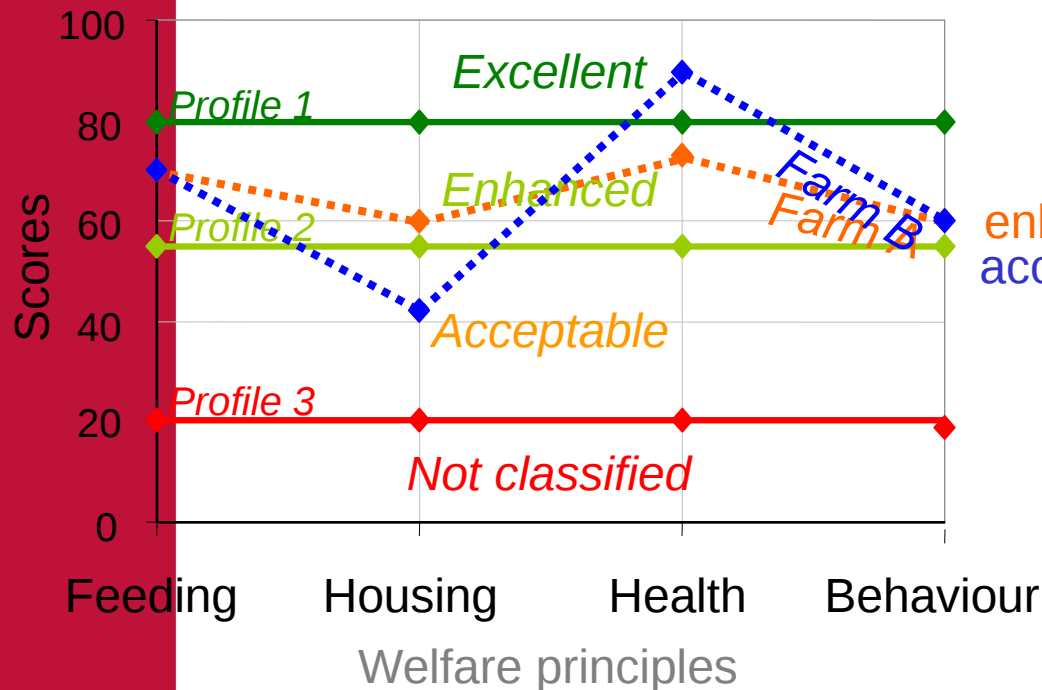
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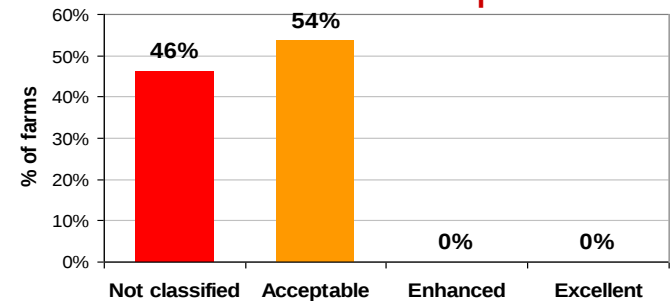


Definition of:

⇒ *membership rules*

enhanced ⇒ UNANIMITY?
acceptable

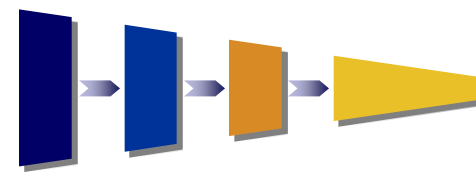
Confrontation with practice



Distribution of 69 dairy farms visited within Welfare Quality®

From principles to overall assessment

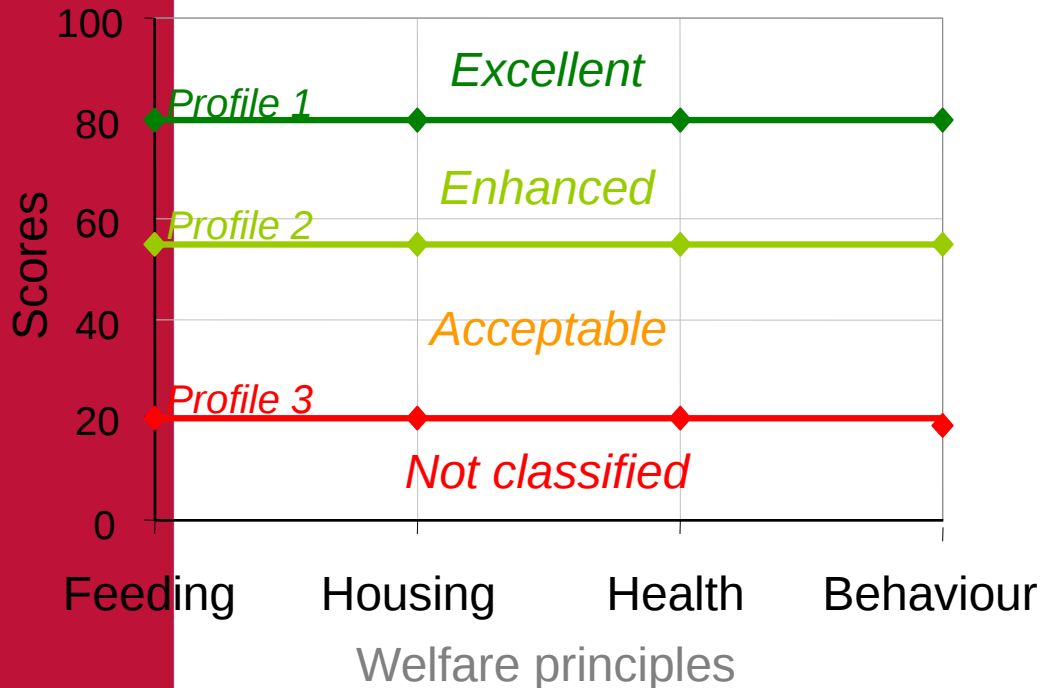
Q3 dogmatic vs. pragmatic approach?



Objective = To assign farms to ordered welfare categories

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Definition of:

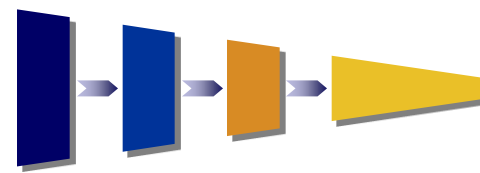
⇒ *membership rules*

⇒ ~~UNANIMITY~~

⇒ *Set of different rules*

From principles to overall assessment

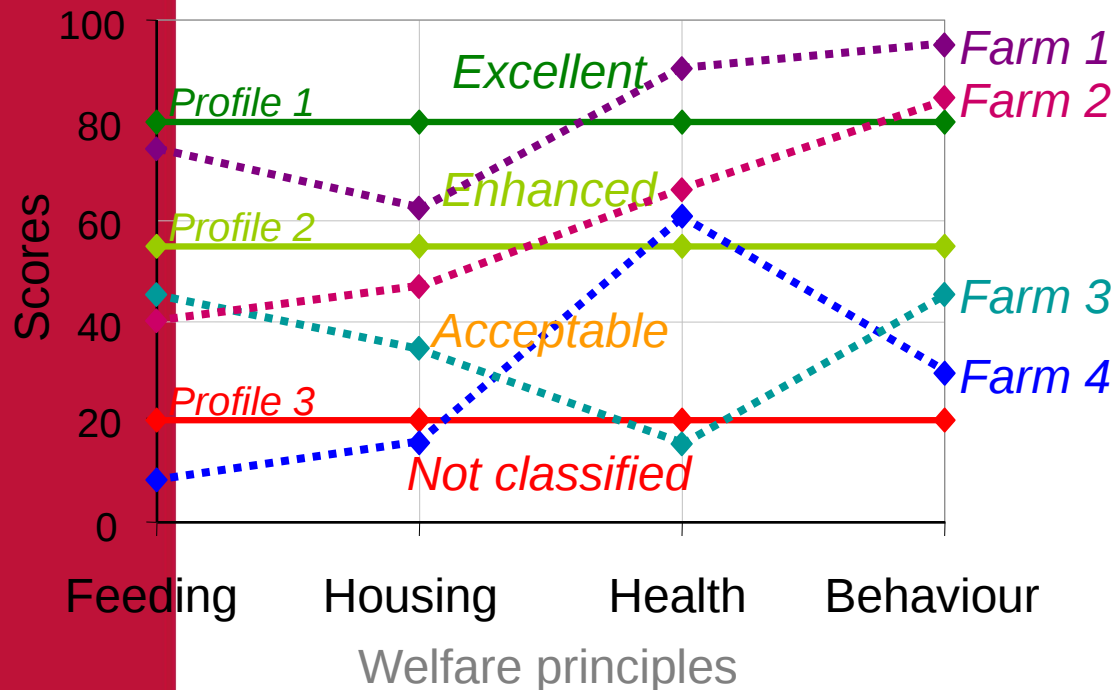
Q3 dogmatic vs. pragmatic approach?



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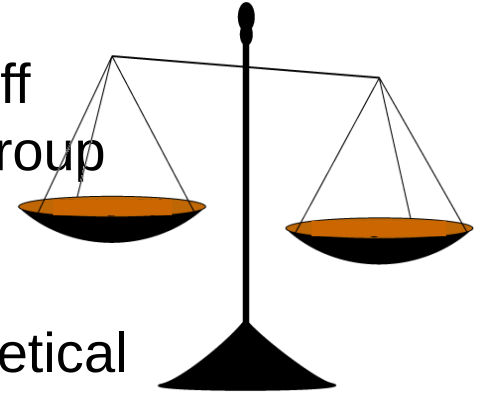
⇒ *Comparison to pre-defined profiles that delimit the categories*



≥ 2 and 2
≥ 2 and 2
≥ 3 and 1
else

Conclusion on evaluation model

- Balance between priority given to the worse off animals and overall welfare of all animals in a group
- Compensation between criteria is very limited
- Balance between societal expectations (theoretical judgement of farms) and what can realistically be achieved in practice



a **software** is being developed
for the storage of data
and the calculations of scores

Next step



Training in the use of the tools in a uniform and reliable way

1. Information of the measures

- Scope
- Sampling size and sampling strategy
- Method description (order of the measures)
- Classification (scoring system)

Training of observers

Training workshop

- Evaluation with photos or video clips of each measure.
- Discussion marked differences with gold standard
- Discussion of the protocol
- Visit to farm and abattoirs for training by direct observation. (explanation of the golden standard)
- Evaluation of the measures by direct observation.
- Statistical evaluation of on-farm data.

A scenic view of a village with a large parking lot in the foreground and a forested hill in the background. The parking lot is filled with various cars and vans. The village features several buildings, including a prominent red brick building with a white roof. The background is a dense forest of trees, with mountains visible in the distance.

Thank you for your attention

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