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*for Veterinary Training, Epidemiology,  
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## Assessing Animal Welfare

**Third OIE Regional Workshop**  
**Stray Dog population management for Balkan countries (SDB3)**  
**Belgrade, Serbia – 13-15 June 2018**

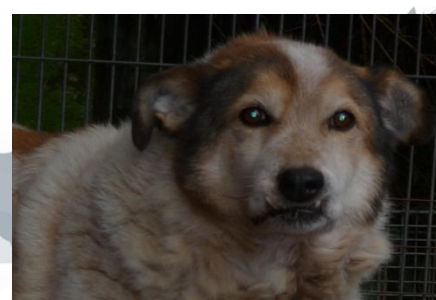


- **National Framework Law 281/91**
  - **NO KILL policy**
  - Euthanasia only in case of:
    - Incurable disease/pathology
    - The dog is proven to be dangerous
  - **Variability of long-term shelters**
    - Different scenarios because each Region has its framework to define shelter standard and requisites
  - **Imbalance between high numbers of dogs entering the shelter and low adoption rates**
    - Adoption
    - Returned to owner
    - Remain in shelter for life
  - **High costs**
  - **AH/AW issues**



# Why AW and public health is at risk?

HAZARDS	ADVERSE EFFECTS
Overpopulation	Direct consequences <ul style="list-style-type: none"> <li>• on the animal health and welfare (health and welfare impairments)</li> <li>• on public health (zoonosis transmission, bite events)</li> </ul>
Inadequate housing conditions	
Social deprivation	
Poor health surveillance	
Absence of minimum requirement for shelters	



Due to individual variability dogs may perceive the same stressors differently and could exhibit different behavioural responses when housed in similar condition.

It is important to have a tool that allows a direct evaluation of the real welfare state of dogs housed in a shelters by observing individual reaction to the their environment.





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# Why to assess AW in long-term shelters?

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- **Improve the quality of life of housed dogs**
- **Define appropriate management and environmental adequacy**
  - Improve coping abilities and adaptation
- **Improve adoptability of dogs**
  - Decreasing of sheltered dogs' population
- **Improve the welfare of shelter operators**

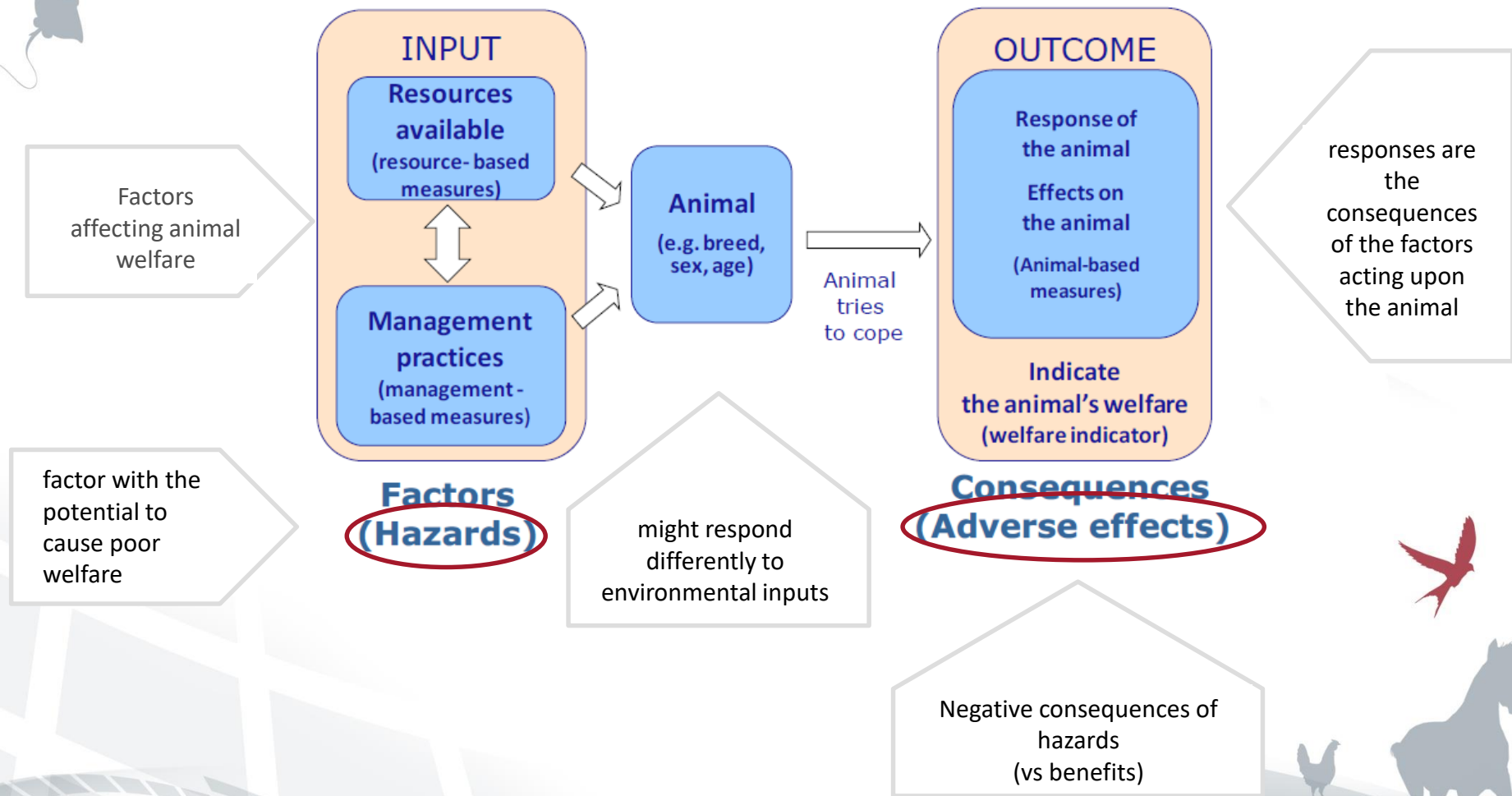






# Risk assessment applied to Animal Welfare

Source: EFSA 2012



# Animal based measures

- In the past the attention has been focused on **welfare inputs** (e. g. minimum standard of pens space allowance)
- Now, both **EU** and **OIE** recognise the importance to assess the livestock's animals using animal based measures (**welfare outcomes**)
- **Animal based measures** are the most accurate reflection of welfare state



EC (2012) European Union Strategy for the Protection and Welfare of Animals 2012-2015. Brussels

OIE (World Organisation for Animal Health) (2013) Guiding principles on animal welfare of the Terrestrial Animal Health Code. [www.oie.int](http://www.oie.int)





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# Positive welfare concept

Positive welfare outcomes complementary to  
negative welfare outcomes

- To focus the attention on input variables that are important for animals and that determine positive outcomes as positive behaviour (e.g. play, sociability)
- To assess if the animal is in a condition of positive emotional state appears essential for a comprehensive assessment of welfare (e.g. QBA)

*Yeates & Main (2008) The assessment of positive welfare. The veterinary Journal 175: 293-300*





IZSAM ABRUZZO EMERGENCY RESPONSE

# The IZSAM Shelter Quality approach

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The IZSAM protocol was inspired from the **Welfare Quality<sup>®</sup>** assessment systems

**Welfare Quality<sup>®</sup> projects were successfully designed and applied to livestock animals**

WQ based their scientifically validated **measures** on 12 **criteria** grouped into four main **principles**

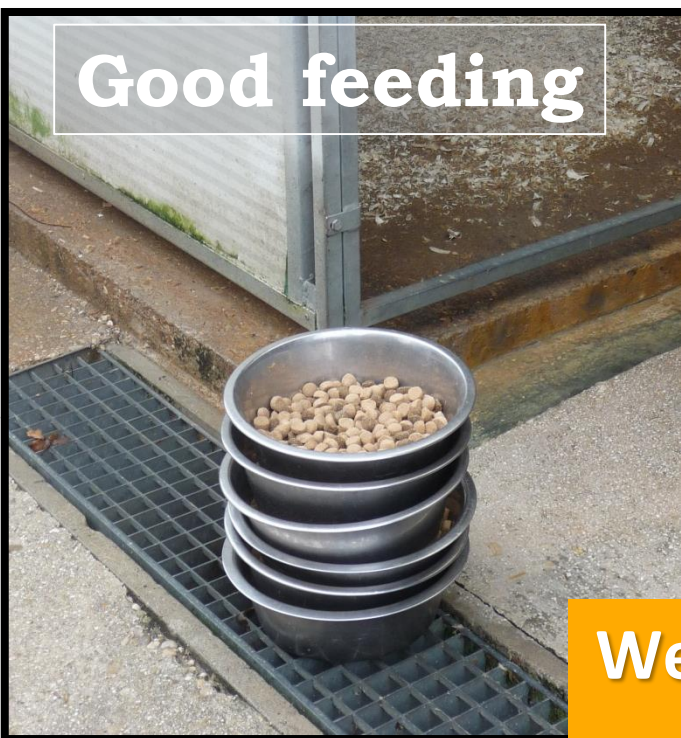


Welfare Quality

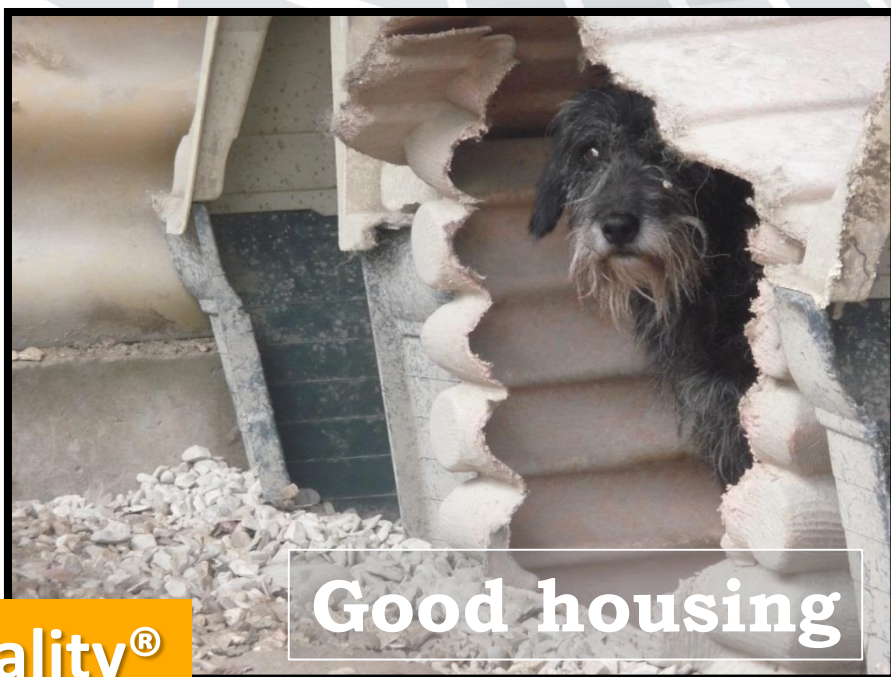
NEN



**Good feeding**

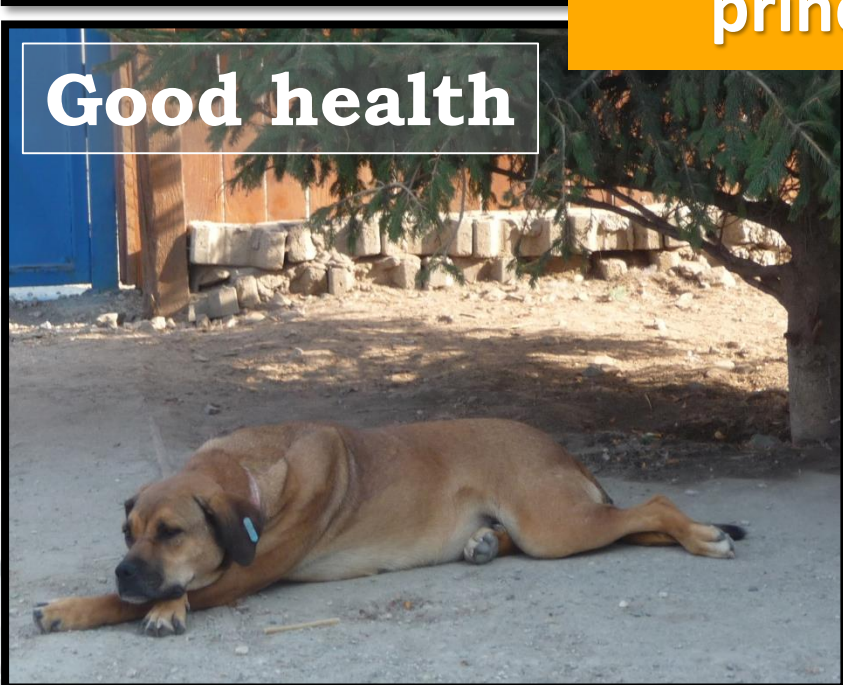


**Good housing**



**Welfare Quality<sup>®</sup>  
principles**

**Good health**



**Appropriate  
behaviour**





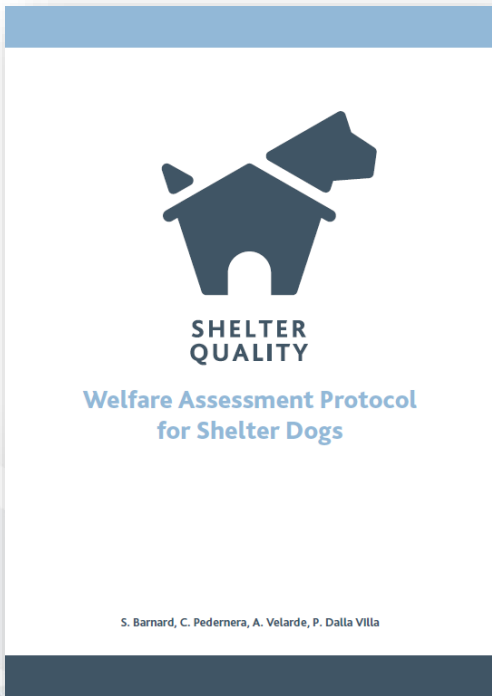
# Summary of SQ protocol measures

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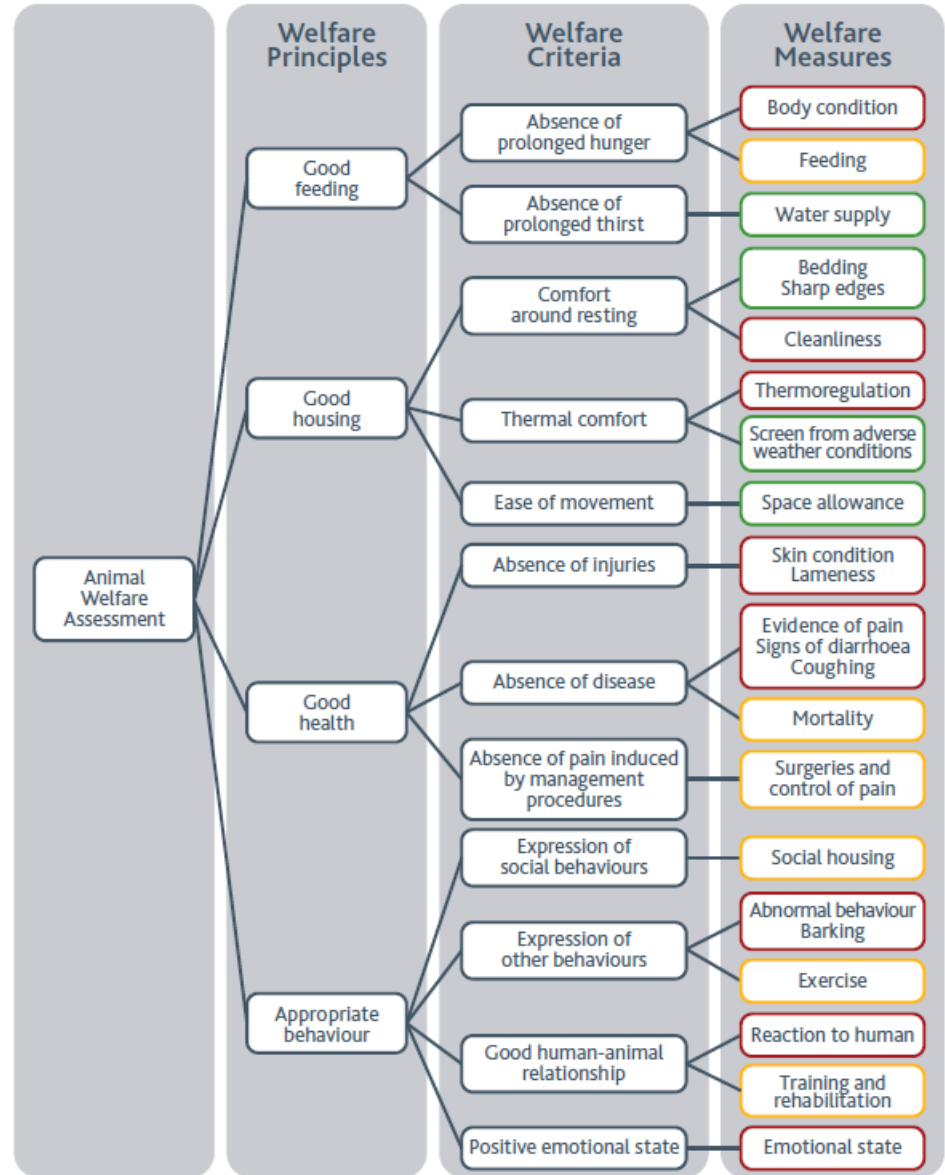
**ANIMAL-BASED MEASURES**

**RESOURCE-BASED MEASURES**

**ANIMAL-BASED MEASURES**

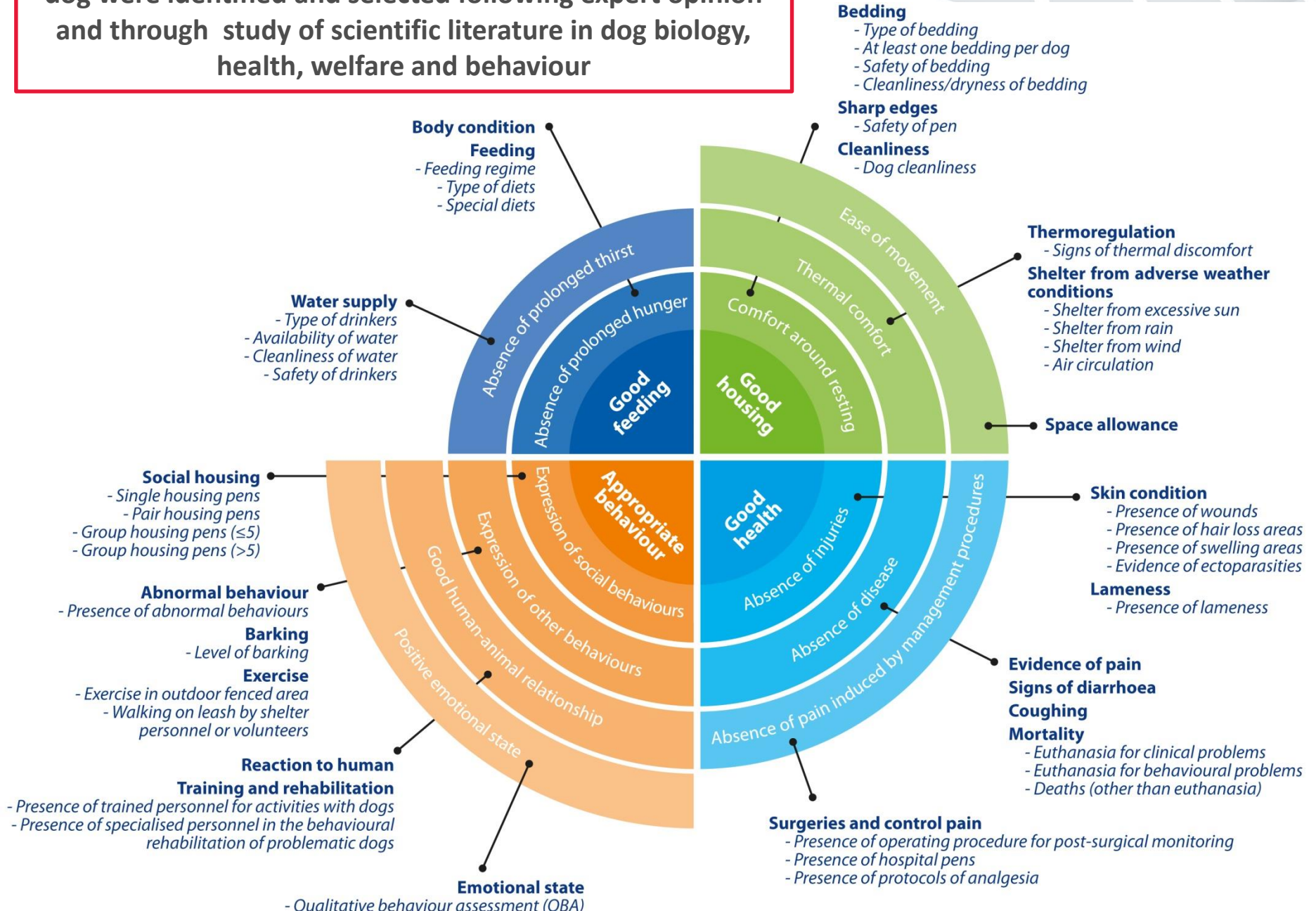


Summary of the animal (red), management (yellow) and resource (green) based measures described in the protocol according to the welfare principles and criteria.





Measures and procedures to assess the welfare of domestic dog were identified and selected following expert opinion and through study of scientific literature in dog biology, health, welfare and behaviour





# Methodology

## Sample size indications

- The sample size depends on the number of dogs housed at the day of the assessment. This values are calculated for obtaining a representative sample of the entire assessed shelter (Table 1).
- Include only dogs over 6 months and that have been in the shelter for two months or more
- Sampling should be random: only assess a maximum of three dogs per pen (to evaluate the measures at individual level)
- Number of selected pens depends on dog sample size and should cover the different facilities in the shelter (shelter map can be useful)

Table 1. Sample size

Total number of housed dogs	Number of animals to assess
up to 29	all dogs
30-59	30
60-89	40
90-139	50
140 over	60









**①**

General information about shelter management + Shelter map



**②**

Define the n° of the dogs to assess on the basis of the total n° of dogs housed in the shelter  
*(a representative sample obtained mathematically)*

Define the n° of the pens to assess  
*(randomly on the map; 20 is the max n° of pens suggested in term of time)*



**③**

Start the assessment

**a**

2 meters from the pen. No interaction with animals (unless required by protocol)

**b**

Visually choose the subjects that will be assessed later at individual level (max 3 dog per pen)

**c**

Observe all animals in the pen for 1 minutes and maintain a neutral and relaxed posture

**d**

It's possible to conduct the assessment from inside the pen if there are many dogs or the pen is large

**e**

Start observing the chosen dogs one at time

**f**

Carry out the short test situation to score fear/aggression

**g**

Record the presence or absence of anomalous behaviours

**h**

Record the emotional state profile and barking level (VAS scale)

**i**

Repeat the same procedure for each selected pen (from a to h)





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- 1. Shelter level:** the measures are recorded evaluating the shelter as a unit. It includes mainly management-based indicators (e.g. feeding regimen, exercise routine).
- 2. Pen level:** the measures are recorded evaluating each pen as a unit and observing all the animals confined in it (irrespective of the number of animals). Parameters measured at pen level are both resources-based (e.g. space allowance, bedding) and animal-based (e.g. behaviour, diarrhoea)
- 3. Animal level:** the measures are recorded evaluating each animal as a unit. All measures are animal-based (e.g. BC, health parameters)







# Measures scored at (1) shelter level

- **General information**
- **Social housing**
- **Exercise**
- **Training/rehabilitation**
- **Surgeries/pain control**
- **Mortality**
- **Feeding**







## Shelter ID

- **Number of dogs present in the shelter on the day of the visit**
  - Excluding hospitalised animals
- **Number of hospitalised dogs**
- **Number of dogs entered in the previous solar year**
- **Number of adopted dogs in the previous solar year**
  - Excluding dogs returned to their owners
- **Temperature (°C) & humidity (%)**





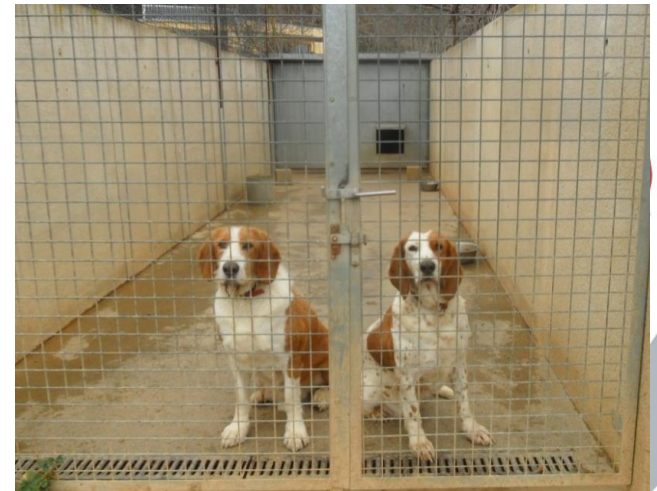
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# Social housing

- Dogs are **social animals**, isolation is detrimental for their welfare.
- **Single housing should be avoided** in shelters especially when dealing with long-term confinement.
- **Isolation** is acceptable for clinical or safety reasons.





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# Social housing

**Type of measure:** Management based

- **Welfare criteria:** Expression of social behaviour
  - Number of single housing pen
  - Number of pair housing pen
  - Number of group housing pen ( $\leq 5$ )
  - Number of group housing pen ( $> 5$ )
  - Total number of pen





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**Type of measure:**  
Management based

- **Welfare criteria:**  
Expression of other behaviours

**Small enclosures discourage exercise and restrict the type of locomotion and the ability of the dogs to control social interaction and express natural behaviour**

# Exercise

- **Outdoor fenced area**
  - Daily (> 3 hours)
  - Daily (< 3 hours)
  - Weekly
  - No or there is not a regular routine (depends on personnel availability)
- **Outdoor walking on leash by shelter personnel**
  - Daily
  - Weekly
  - No or there is not a regular routine (depends on personnel availability)







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# Training and rehabilitation

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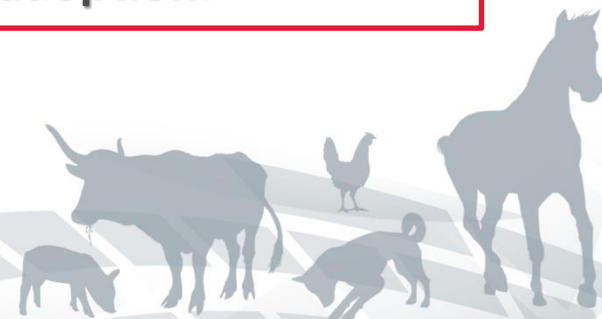
## Type of measure:

Management based

- **Welfare criteria:** Good human-animal relationship
  - Presence of trained personnel for activities with dogs
    - Walk at leash
    - Basic education
    - Learning activities
  - Presence of specialised personnel in the behavioural rehabilitation of problematic dogs

**Basic dogs training and learning can help the development of mental activities and are the basis for an adequate human-animal bond and improve the possibility of adoption.**

**The behavioural rehabilitation promotes human-animal relationship, improves dogs welfare and the possibility of adoption.**





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# Surgery and control of pain

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**Type of measure:** Management based

- **Welfare criteria:** Absence of pain induced by management procedure
  - Presence of operating procedure for post-surgical monitoring
  - Presence of hospital pens
  - Presence of protocols of analgesia





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# Feeding

**Type of measure:** Management based

• **Welfare criteria:** Absence of prolonged hunger

- **Type of diet**

- Pellets
- Cooked food
- Canned food

- **Special diets** for puppies, old animals, hospitalised animals

- **Feeding regimen**

- Once per day
- Twice per day
- Ad libitum





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# Mortality

**Type of measure:** Management based

- **Welfare criteria:** Absence of disease
  - Number of  **euthanasia** because of  **health problems** (in previous solar year)
  - Number of  **euthanasia** because of  **behavioural problems** (in previous solar year)
  - **Number of death other than euthanasia** (in previous solar year)
  - **Dog shelter population** (mean number of animals in previous solar year)







# Measures scored at (2) pen level

- Space allowance
- Sharp edges
- Water supply
- Bedding
- Panting/shivering/huddling
- Barking level
- Abnormal behaviour
- Evidence of pain
- Diarrhoea
- Coughing
- Emotional state







# Space allowance

**Type of measure:** Resources based

- **Welfare criteria:** Easy of movement
  - Enclosure length and width (m)
  - Number of animal in the pen up 20 kg
  - Number of animal in the pen over 20 kg

**Space expressed in m<sup>2</sup> per dog**  
**The adequacy is calculated using**  
**the recommendation of**  
**2010/63/UE**

These dimensions are acceptable only if animals have access to outside runs and/or daily exercise.

Weight (Kg)	Minimum enclosure size for one or two animals (m <sup>2</sup> )	For each additional animal add a minimum of (m <sup>2</sup> )	Minimum height (m)
Up to 20	4	2	2
Over 20	8	4	2

**Excessive spatial restriction could be associated to the impossibility to express normal behaviours, increasing probability of active repetitive behaviours**

**Maintain three different areas:**

- **Feeding space**
- **Resting space**
- **Litter space**



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# Sharp edges

**Type of measure:** Resources based

- **Welfare criteria:** Comfort around resting
  - Presence of sharp edges or protrusions inside the pen or along the fence that could be harmful for dogs





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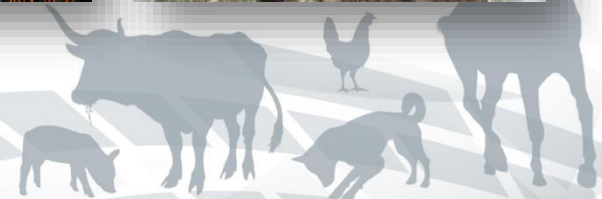
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**Type of measure:** Resources based

- **Welfare criteria:** Comfort around resting
  - Type of bedding (kennel, basket, other)
  - At least one bedding per dog
  - Bedding is safe (no harmful edges or ingestible parts)
  - Bedding is dry and clean







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# Water supply

 **Type of measure:** Resources based

- **Welfare criteria:** Absence of prolonged thirst
  - Type of drinkers (bowl, bucket, automatic fountain, other)
  - Drinkers are functioning (full/empty)
  - Water is clean (with faeces or mould)
  - Drinking is safe (no sharp edges)



# Shelter from adverse weather condition



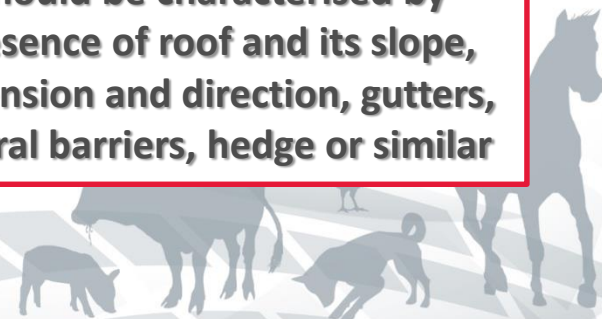
**Type of measure:** Resources based

- **Welfare criteria:** Thermal comfort
  - Shelter from excessive exposure to sun
  - Shelter from strong wind
  - Shelter from rain
  - Air circulation



**Indoor area (area with vertical walls and roof) should be insulated, shelter from adverse weather condition and ensure air circulation**

**Outdoor area: fenced pens should be characterised by presence of roof and its slope, extension and direction, gutters, lateral barriers, hedge or similar**





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# Thermoregulation

**Type of measure:** Animal based

• **Welfare criteria:** Thermal comfort

- Number of animals panting per pen
- Number of animals shivering/huddling per pen



**It's a sensible measure because  
depends on different seasons**

**Thermal comfort can vary from dog to  
dog as strictly linked to different  
condition such as hair length, muzzle  
shape, age or physical conditions**

**Panting: dog pants for physical exertion  
when temperature is warm**

**Shivering: it is a physical response to  
cold, especially if associated to huddling**





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# Abnormal behaviours

**Type of measure:** Animal based

- **Welfare criteria:** Expression of other behaviours
  - Presence/absence of dogs showing active repetitive or other compulsive behaviours



## Active repetitive:

- Circling
- Pacing
- Whirling-tail chasing
- Wall bounce

## Other compulsive behaviour:

- Self-mutilation
- Environment related: compulsive licking ground or licking/chewing fence, bedding or other object







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# Diarrhoea-Coughing-Pain

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**Type of measure:** Animal based

• **Welfare criteria:** Absence of disease

- Presence of visible liquid manure in the pen
- Presence of dogs coughing in the pen
- Presence of dogs showing sign of discomfort or pain in the pen



# Emotional State

SHELTER: \_\_\_\_\_ DAY: \_\_\_\_\_ ASSESSOR: \_\_\_\_\_

Relaxed | Min. \_\_\_\_\_ Max. |

Comfortable | Min. \_\_\_\_\_ Max. |

Curious | Min. \_\_\_\_\_ Max. |

Excited | Min. \_\_\_\_\_ Max. |

Sociable | Min. \_\_\_\_\_ Max. |

Playful | Min. \_\_\_\_\_ Max. |

Depressed | Min. \_\_\_\_\_ Max. |

Alert | Min. \_\_\_\_\_ Max. |

Nervous | Min. \_\_\_\_\_ Max. |

Anxious | Min. \_\_\_\_\_ Max. |

Fearful | Min. \_\_\_\_\_ Max. |

Hesitant | Min. \_\_\_\_\_ Max. |

Aggressive | Min. \_\_\_\_\_ Max. |

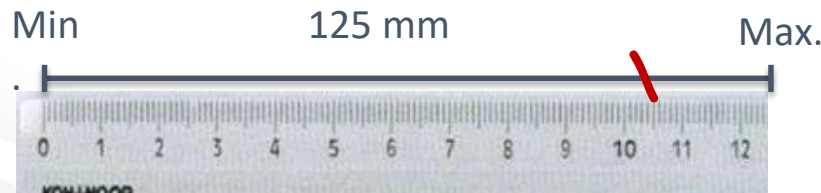
Barking level | Min. \_\_\_\_\_ Max. |

**Type of measure:** Animal based  
**Welfare criteria:** Positive emotional state

**Emotional state** focus not so much on what an animal does, but on how it does it, that is, its dynamic style of interaction with the environment (*Wemesfelder 2001*)

## Barking level

- **Type of measure:** Animal based
- **Welfare criteria:** Expression of other behaviours
  - Perceived noise in the pen using the VAS scoring (when assessing the emotional state)



**Visual Analogue Scales:** to quantify how much an adjective represents the animals housed in that pen.

It is defined by its left 'minimum' and right 'maximum' point. Min. means that the expressive quality indicated by the term is entirely absent in any of the animals you have seen. Max. means that this expressive quality is dominant across all observed animals.



# Measures scored at (3) individual level

- Reaction to human
- Body condition
- Cleanliness
- Skin condition
- Lameness

A sample of dogs will be selected to assess individual measures depending by the dog population size

Animals assessed within one pen should be sampled in random order (maximum 3 dogs per pen)





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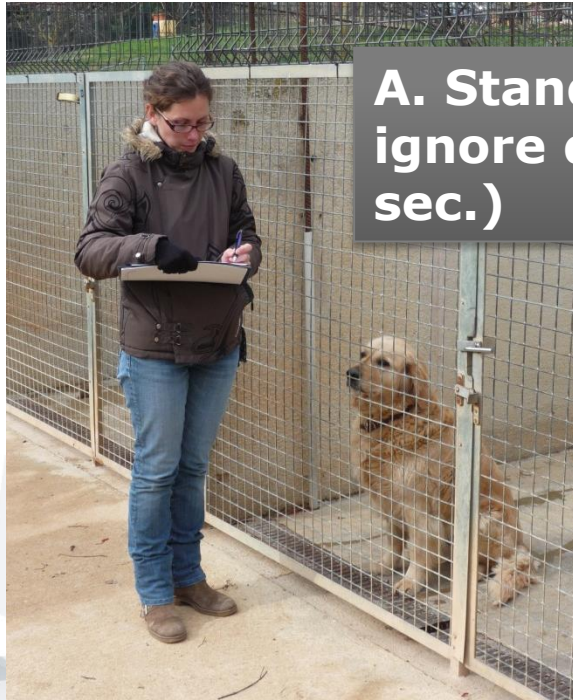
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**Type of measure:** Animal based

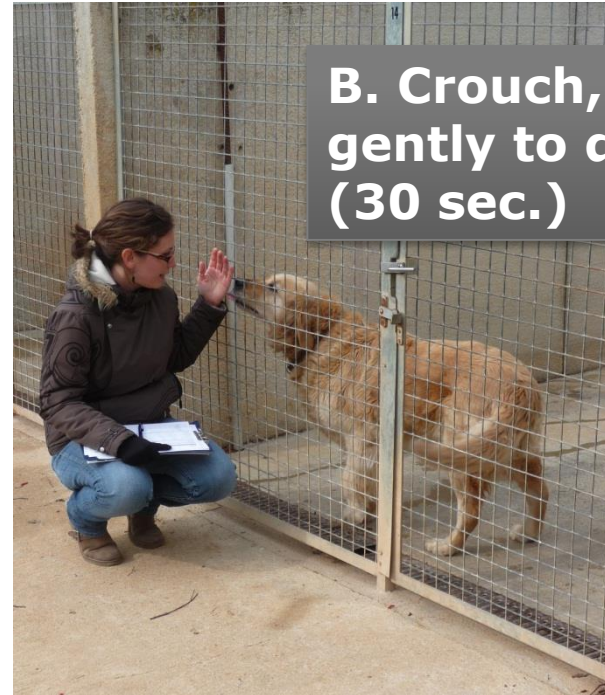
**Welfare criteria:** Good human-animal  
relationship

# Reaction to humans

Fear and aggression are among the most common behavioural problems that impair interaction between dogs and human beings, thereby representing a failure in communication between the two species and also a decreasing chance of adoption



**A. Stand still,  
ignore dog (30  
sec.)**







**B. Crouch, talk  
gently to dog  
(30 sec.)**





# In presence of unfamiliar person the dog can show:

Score	Description
0-no signs	<p>No signs of fear or aggression, posture is neutral, relaxed looking at or ignoring the assessor, or friendly/sociable, decreasing distances and/or greeting the assessor.</p> 
1-fear	<p>Signs of fear, associated to low or very low postures, often increasing distances or hiding from assessor, ears back, eye contact brief and indirect, tail hangs low or tacked between legs.</p> 
2-defensive/offensive aggression	<p>Sign of aggression, with or without fear, are usually characterized by a general condition of tension of the dog's body.</p> <p>Sign of fear and of defensive aggression: body lowered, weight over rear legs, tail down tense or tucked between legs, hackles raised, ears back, pupils dilated, muzzle tense, nose wrinkled, snarled teeth exposed.</p> <p>Signs of offensive aggression: weight forward, tail stiff, raised, ears erect forward, bared teeth and lips curled, eyes staring, hackles may be up.</p>  








# Body condition



Type of measure: Animal based

- Welfare criteria: Absence of prolonged hunger

Score	Description
Too thin	Bones easily visible (i.e. ribs, pelvis, lumbar vertebrae); loss of muscle mass, obvious waist and abdominal tuck. 
Adequate	No excess of fat covering; observable waist when viewed from above, abdominal tuck when viewed from side. 
Too heavy	Excessive fat cover, ribs not palpable; fat deposit on neck and limbs; waist absents and abdominal distension present. 

The score should be only visual. For the purpose of this welfare assessment, the ability to detect animals which are at inappropriate condition is the main objective.

A simplification of body condition system:

- TOO THIN
- ADEQUATE
- TOO HEAVY







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# Cleanliness

**Type of measure: Animal based**

- **Welfare criteria: Comfort around resting**
  - Animal is clean
  - Animal is dirty/wet

The coat should be clean and dry, free from urine or faeces. Cleanliness of the body parts is defined as the degree of dirt of the body (splashing).

Assess the coat of the dog and look for wet or dirty areas with faeces.

The assessment is visual on ONE side of the body.

Make sure the dog is standing up for a correct assessment.





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# Skin condition

**Type of measure:** Animal based

• **Welfare criteria:** Absence of injuries

- Presence of visible wounds
- Presence of hair loss areas
- Presence of swelling areas
- Evidence of ectoparasites



Skin condition is an indicator of poor welfare related to the enclosure but also to health problems

Skin condition is assessed by the observation of ONE SIDE of the dog's body

Wound will be scored only if are recent, infected or larger than 2 centimeters





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# Lameness

**Type of measure:** Animal based

**Welfare criteria:** Absence of injuries

- Score 0: dog shows no lameness
- Score 1: dog is lame but is still walking
- Score 2: dog is severely lame, almost or completely unable to walk

The observation of lameness could suggest the presence of foot wounds or other painful disease.

A dog with a surgically amputated limb will receive a score of 0 if the amputation doesn't compromise the dog health. Dogs generally well tolerate healed amputations (without wounds or infected parts).

Otherwise, a dog with a amputated limb with complications will receive a score of 1.

The dogs are observed while walking







Measures	Sampling	Time needed approximately
<b>1. Management questionnaire</b> - General information - Social housing - Exercise - Training and rehabilitation - Surgeries/pain - Mortality - Feeding	<b>Annex 1</b> Shelter level Score with help of shelter manager	15 min
<b>2. Resources checklist</b> - Space allowance - Sharp edges - Bedding - Water supply	<b>Annex 2</b> Pen level Score from outside/inside the pen	2 min/pen
<b>3. Measures scored at pen level</b> - Screen from adverse weather conditions - Thermoregulation - Abnormal behaviour - Signs of diarrhoea - Coughing - Evidence of pain	<b>Annex 3</b> Pen level Score from outside the pen	1 min/pen
<b>4. Individual assessment</b> - Body condition - Cleanliness - Skin condition - Lameness - Reaction towards human	<b>Annex 4</b> Individual level Score from outside/inside the pen	2 min/animal
<b>5. Emotional state profile</b> - Emotional state - Barking level	<b>Annex 5</b> Pen level Score at the end of each pen assessment	1 min/pen

When performing the assessment in-field, a precise order has to be followed to take the measures



Summary of the welfare measures with main sampling indications and approximate time needed to carry out the assessments parts.





# Application of Shelter Quality Protocol on field

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for Veterinary Training, Epidemiology

- Development of Web application for mobile device

The screenshot shows the login page for the 'SHELTER QUALITY' web application. The page features the title 'SHELTER QUALITY' in large blue letters, with the subtitle 'Welfare Assessment Protocol for Shelter Dogs' below it. To the right of the title is a dark blue silhouette of a dog's head. The page includes a navigation menu with 'Scegli il Tema', 'MANUALE UTENTE', 'CONTATTI', and 'IT - Italiano'. Below the menu are two input fields for 'Username:' and 'Password:', and an 'Entra' button. The page also displays 'Shelter versione 1.2.4-SNAPSHOT []' and a welcome message: 'Benvenuto, inserire nome utente e password per accedere al Sistema.' At the bottom, there is a copyright notice: '© 2015 Istituto "G. Caporale" Campo Boario, 64100 Teramo, Italia - Partita IVA 00060330677 - Codice Fiscale 8006470670'.

Per una corretta visualizzazione di questa pagina, si consiglia una risoluzione di 1024x768 e l'utilizzo di Chrome, Firefox o Internet Explorer dalla versione 11 in poi.



Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise «G. Caporale» (IZSAM)  
Via Campo Boario - 64100 Teramo

- Application of Shelter Quality protocol (SPQ2) in 64 Italian shelters
- Identify risk factors which affected the long-term sheltered dogs' welfare
- Development of scoring system and

- Feeding regimen **ad libitum** and **cooked food** showed a significant association with **inadequate BCS**
- The presence of **skin lesions** was influenced by **bedding inadequacy** and **type of bedding**
- The presence of **dirty/wet dogs** was related to the **cleanliness of bedding materials** and the **non-availability of one bed per dog**
- The **inadequacy of shelter from adverse weather condition** and **bedding materials** were significantly associated with manifestation of **polypnoea**
- The **absence of training activities** with dogs, the impossibility to **outdoor areas' access** and to **walk on leash** increased significantly the probability to observe **fear and aggressive dogs' reaction** toward humans.
- The **presence of diarrhoea** increased significantly when the feeding regimen is **one/day** or **ad libitum** and when **the access to outdoor areas** was not allowed



# Shelter Quality protocol

- Shelter quality protocol is a valid, reliable and practical tool for assessing the dog welfare in shelter long-term confinement
- The emphasis is on animal-based measures (outcome) to estimate the actual welfare state of animals (for example: their behaviour, health or physical condition)
- This approach permits an assessment system that is partially independent of the shelter facilities and management parameters (input)
- The scoring system permits to obtain an objective information about animal welfare situation in long-term shelters through a numerical score
- The scoring system permits to identify the critical points on which to take action in order to improve the animal welfare
- The area of application of SQP may be extended to commercial breeding facilities or other situation in which dogs are confined (e.g. military or working dogs)





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Food Safety and Animal Welfare

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## Further developments

- The App will be updated through the integration of scoring system to obtain automatically the score after the application of SQP
- The App will work offline in order to collect the data also without network-phone coverage





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# Thank you!

