



UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI SCIENZE VETERINARIE
E SANITÀ PUBBLICA



*How to evaluate the
welfare of racing and
sport horses?*

Michela Minero
michela.minero@unimi.it

66th EAAP Conference - Warsaw

- What brings us here?

EUROPE 2030

The equine sector: the story of a sustainable success



How did it happen?
Who made it possible?

- Outline



- Why do we need to assess welfare?

Main drivers for animal welfare policies

Changing values in the society

Market drivers

Integration of AW with sustainable agenda

New relations between producers and society

(from *Andrea Gavinelli*,
Head of the Animal Welfare Unit of the European Commission)

- Why do we need to assess welfare?

Challenges for sport horses (risk factors)

- Doping and medication abuse

- Sport issues

- Aggressive riding

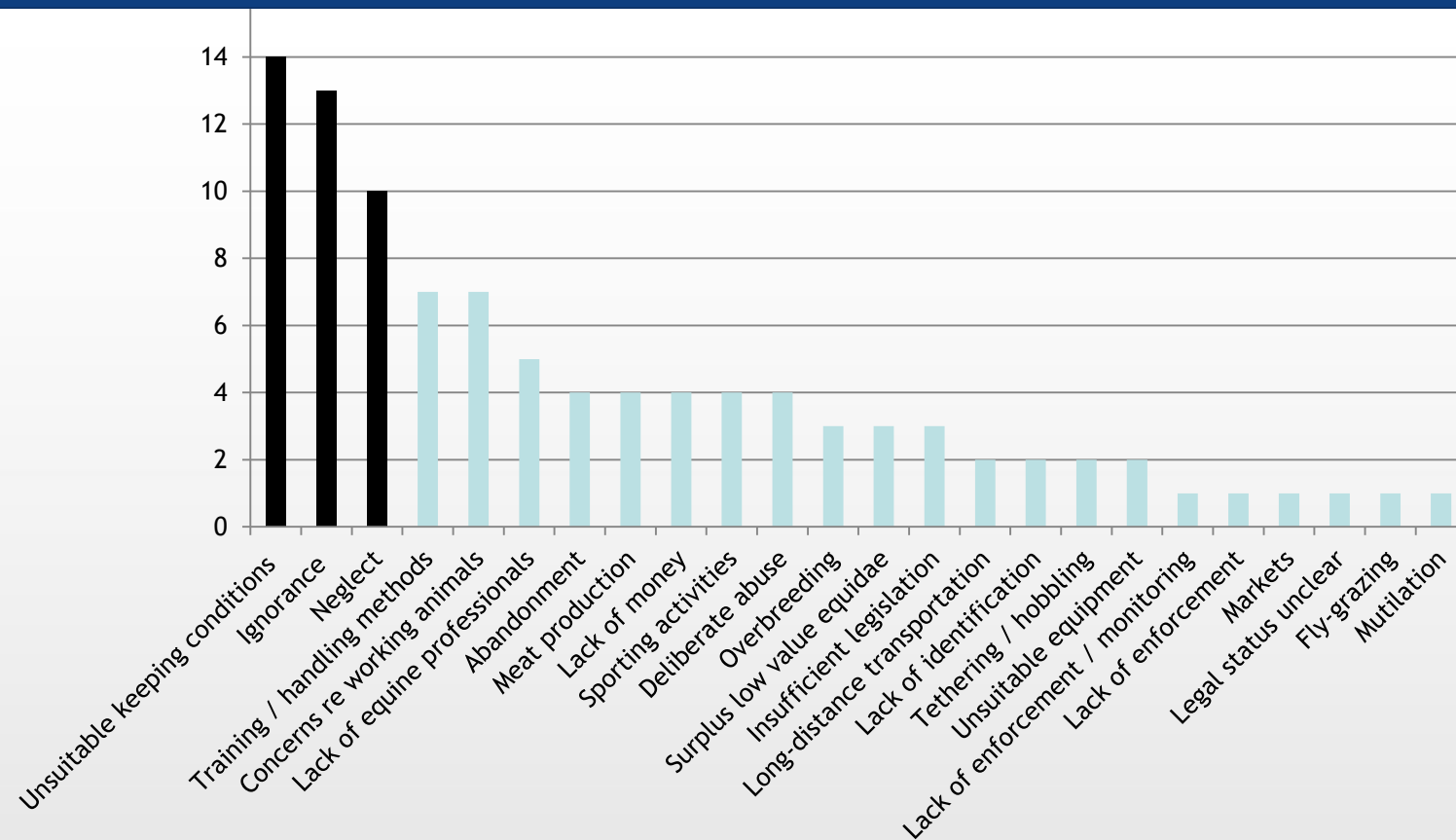
- Injuries surveillance

- Travel with no training

(from *Graeme Cooke, FEI*)

- Why do we need to assess welfare?

Reported welfare problems (risk factors)



From «Removing the blinkers»
 (Roly Owers from WHW and Eurogroup 4 animals)

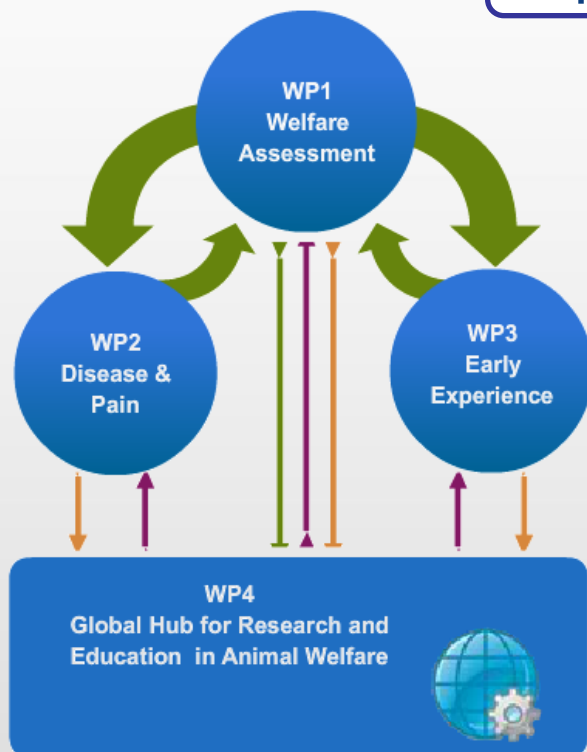


• The AWIN project



Development, integration and dissemination of animal-based welfare indicators, including pain, in commercially important husbandry species, with special emphasis on small ruminants, equidae and turkeys

<http://www.animal-welfare-indicators.net/>



• The AWIN beneficiaries



01. Scotland's Rural College , Scotland
02. Norwegian University of Life Sciences,
Norway
03. The University of Milan, Italy
04. Neiker-Tecnalia, Spain
05. Centro de Estudos Superiores Positivo, Brazil
06. Technical University of Lisbon, Portugal
07. University of Cambridge, Great Britain
08. Washington State University, USA
09. Indiana University, USA
10. Institute of Animal Science, Czech Republic
11. Havelland Horse Clinic, Germany



• The AWIN project



Identify welfare conditions of horses in Europe



Offer a tool box to do it

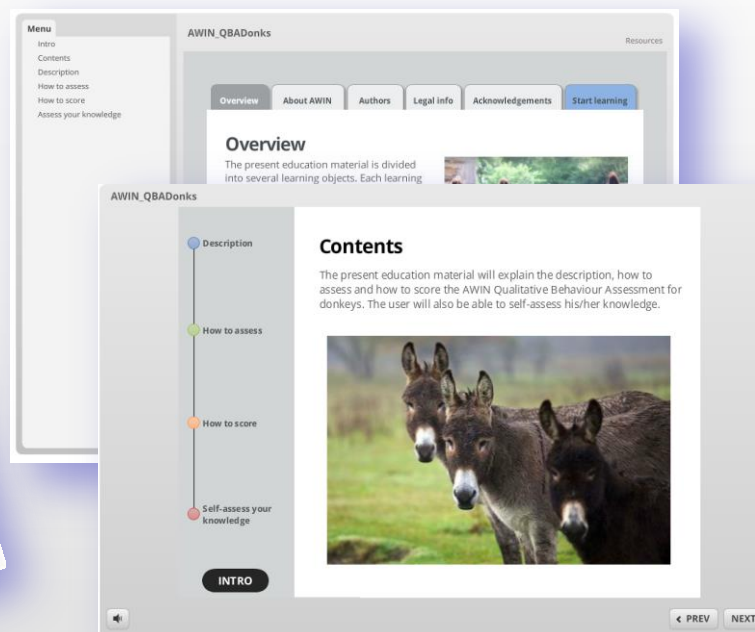
• The AWIN project



How did we face these challenges?

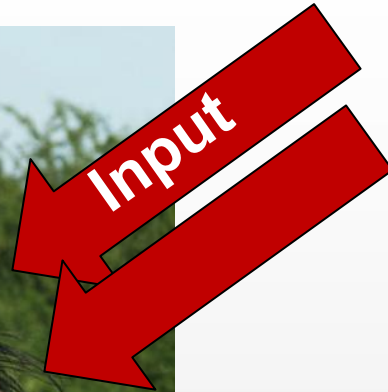


- Protocols, training material, learning objects and apps

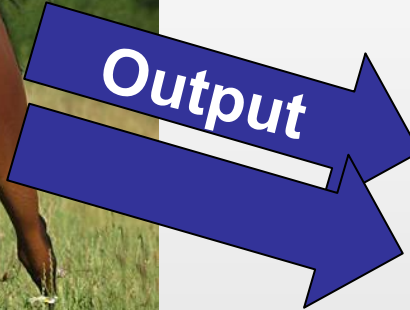


• How to assess welfare

multidimensional concept
measurable quality of a living animal at a particular
time



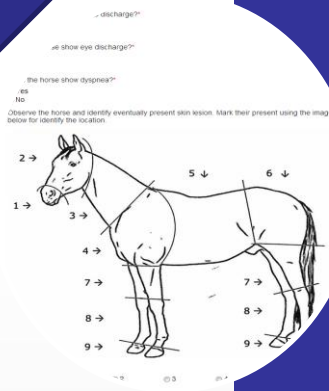
**Evaluation
according to the
resources given**



**Evaluation
according to the
animal based
indicators**

We need integration!

• How to assess welfare



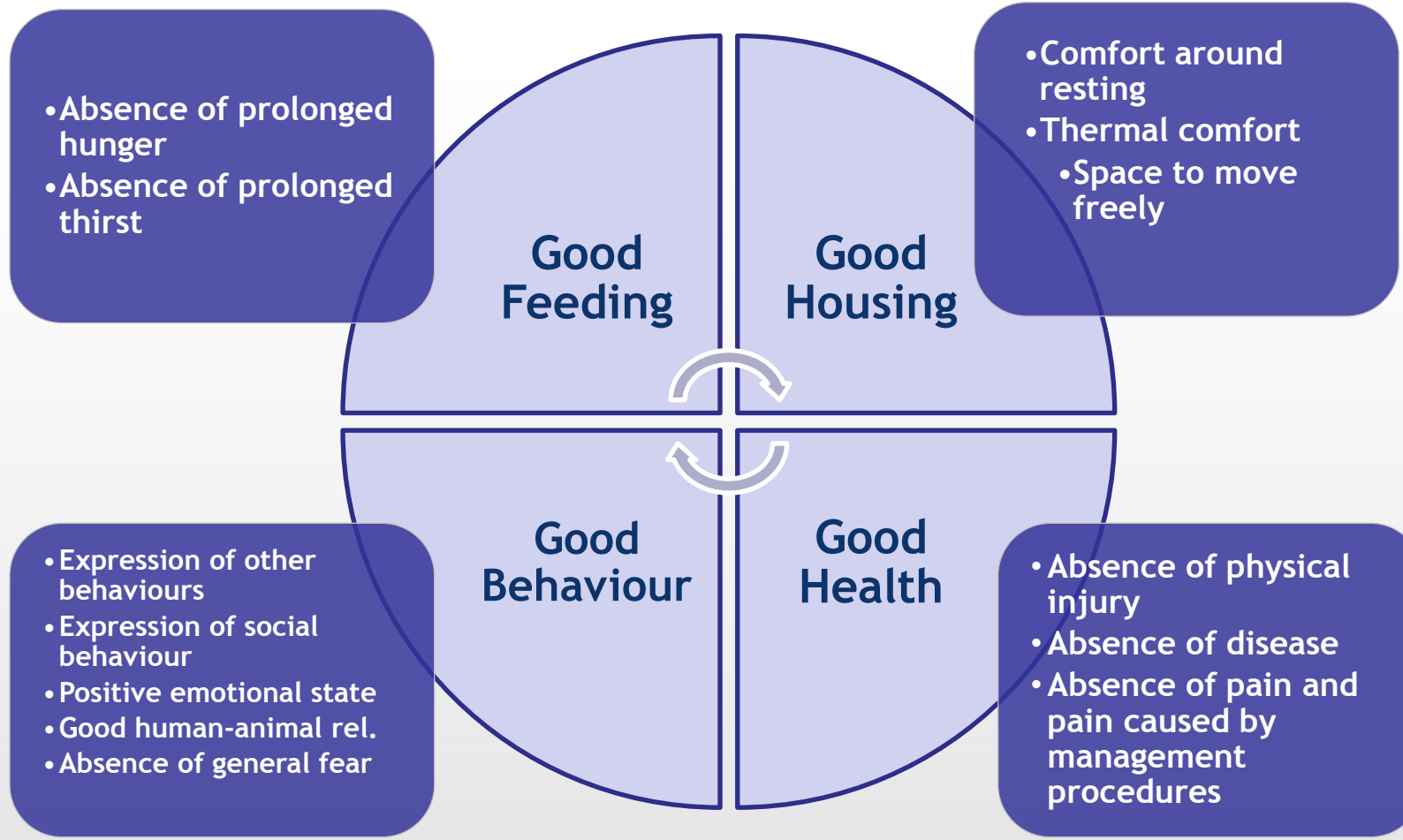
Animal based indicators

Animal based indicators



- ✓ **Valid** = meaningful
- ✓ **Feasible** = practical during on-farm inspection
- ✓ **Reliable** = consistent

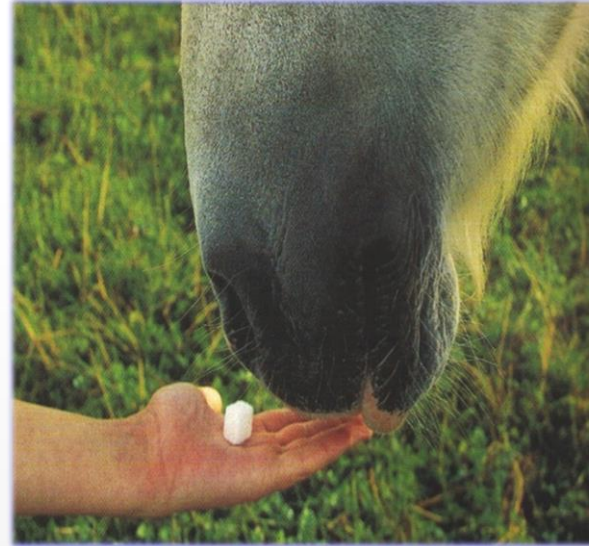
• How to assess welfare



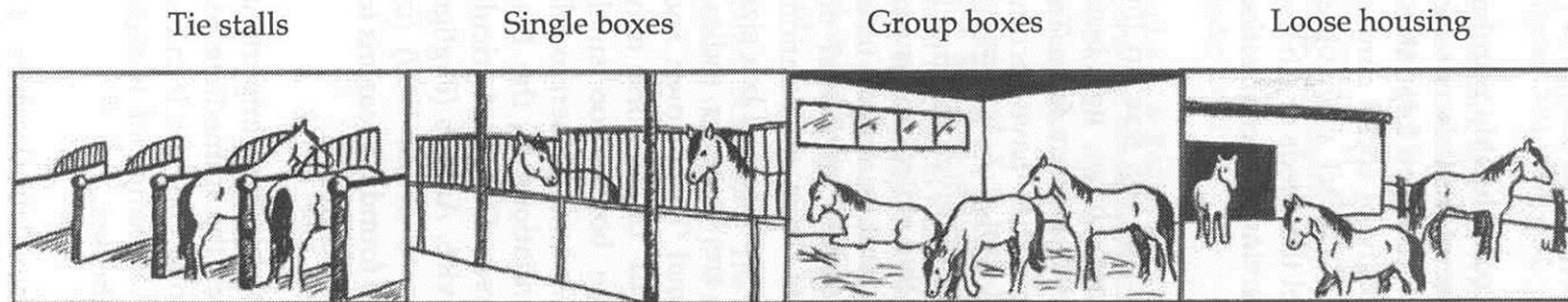
• Challenges faced



Long life expectancy



One facility:
each animal a different owner



Different housing conditions showing different prevalence in different European regions

• Challenges faced



Transportation: frequent/over long distances



- Process to develop the protocol



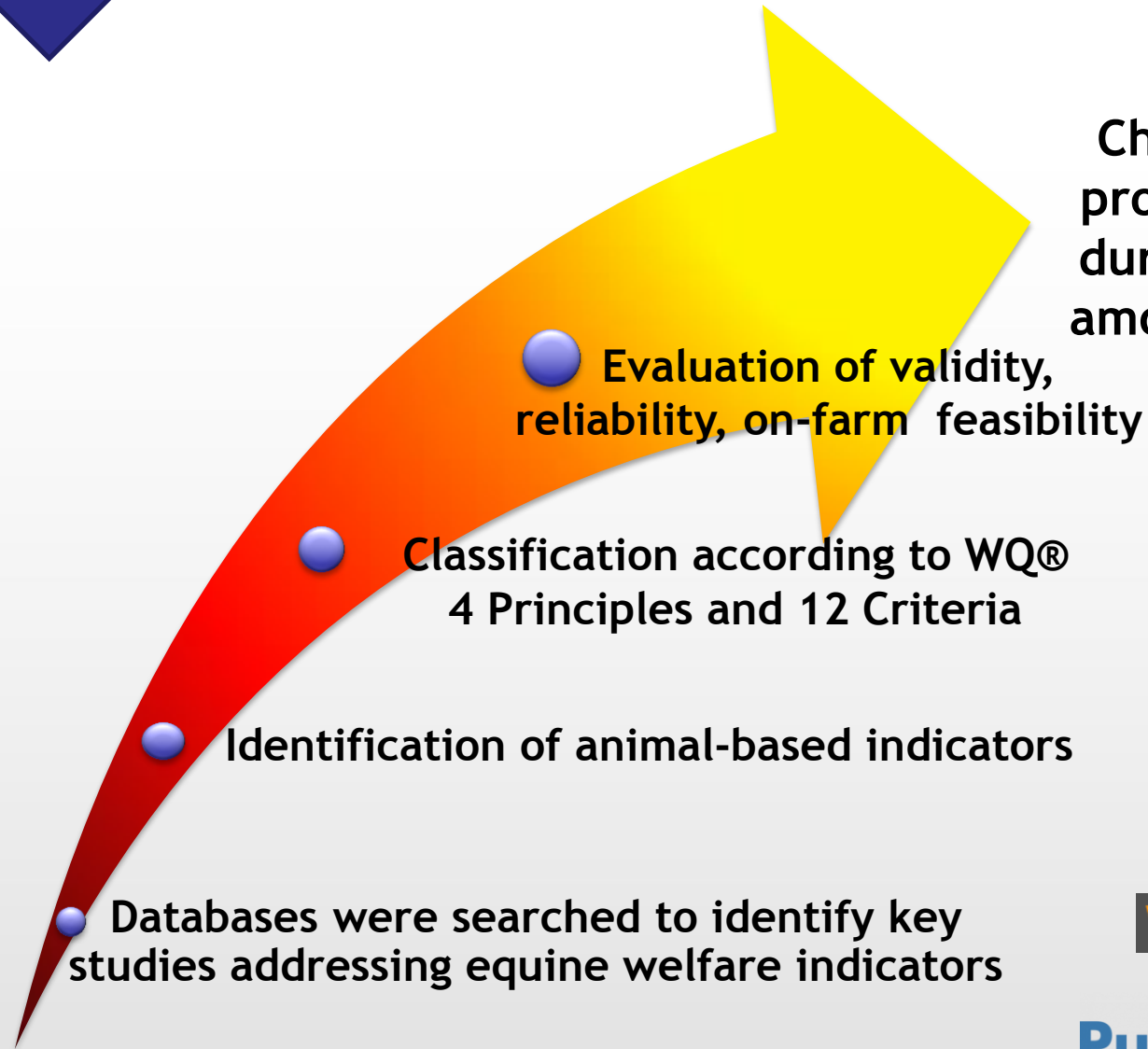
4) testing the prototype protocol on-farm

3) stakeholder consultation

2) research to cover gaps in knowledge

1) selection of promising welfare indicators

• Selection of promising welfare indicators



Choice of the most promising indicators during a focus group among AWIN scientits

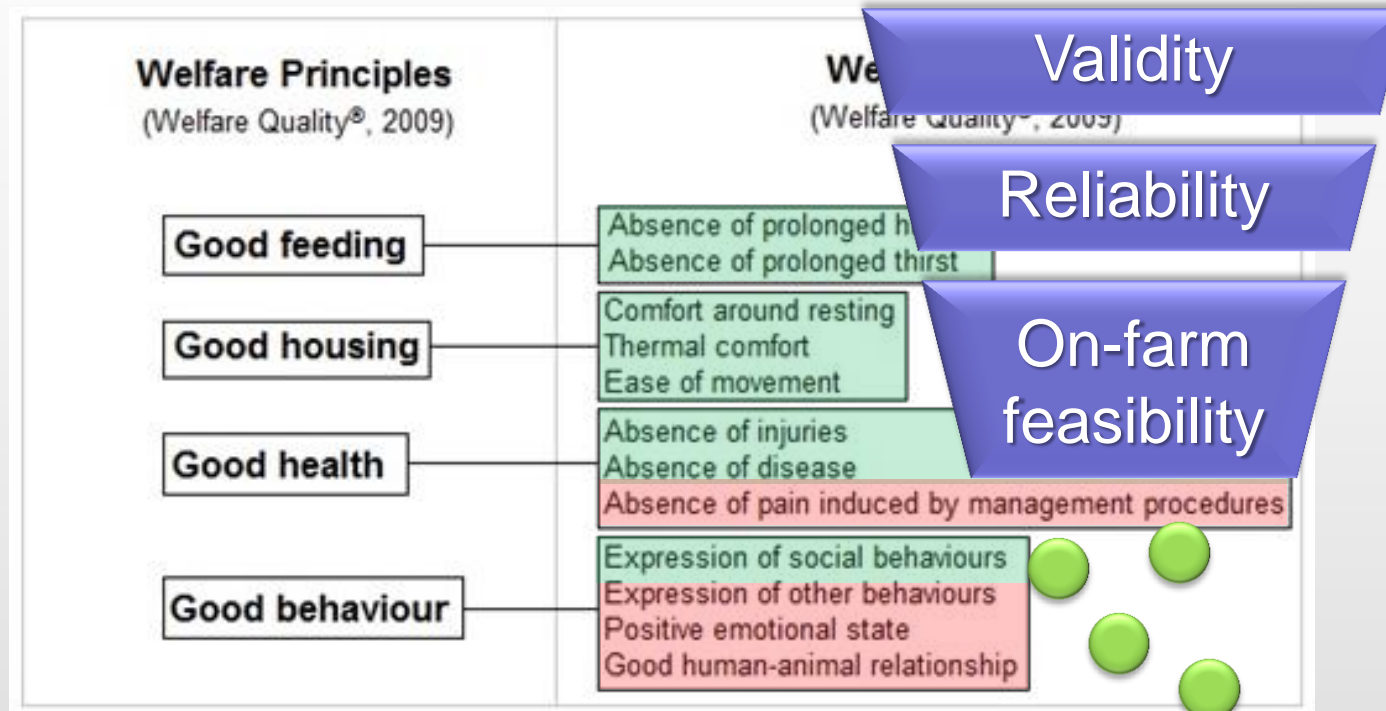


WEB OF SCIENCE™



• Selection of promising welfare indicators

Some Criteria of equine welfare were thoroughly investigated and indicators seem ready for use
 A total **49 welfare indicators** satisfied the search criteria
 For other there is a **lack of scientific research**, particularly in terms of validity and reliability



• Research to cover gaps in knowledge



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www.ufaw.org.uk

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Equine on-farm welfare assessment: a review of animal-based indicators
E Dalla Costa^a, L Murray, F Dai, E Canali and M Minero

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available online

Development of the Horse Grimace Scale (HGS) as a Pain Assessment Tool in Horses Undergoing Routine Castration
Emanuela Dalla Costa^a, Michela Minero¹, Dirk Lebelt², Diana Stucke², Elisabetta Canali¹, Matthew C. Leach³

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Research
Validation of a fear test in sport horses using infrared thermography
Francesca Dai^a, Nathalie Hélène Cogi, Eugenio Ugo Luigi Heinzl, Emanuela Dalla Costa,
Elisabetta Canali, Michela Minero
Dipartimento di Scienze Veterinarie e Sanità Pubblica, Università degli Studi di Milano, Milano, Italy

A study on validity and reliability of on-farm tests to measure human-animal relationship in horses and donkeys
Emanuela Dalla Costa^a, Francesca Dai^a, Leigh Anne Margaret Murray^a,
Stefano Guazzetti^b, Elisabetta Canali^a, Michela Minero^a
^a Università degli Studi di Milano, Dipartimento di Scienze Veterinarie e Sanità Pubblica, Milano, Italy
^b Azienda Unita Sanitaria Locale, Dipartimento di Sanità Pubblica Veterinaria, Reggio Emilia, Italy

- Dalla Costa E., Dai F., Lebelt D., Scholz P., Barbieri S., Canali E., Zanella A.J., Minero M. Welfare assessment of horses: the AWIN approach. Animal welfare, submitted.
- Minero M., Dalla Costa E., Dai F., Murray A.M., Canali E., Wemelsfelder F. Use of Qualitative Behaviour Assessment as an indicator of welfare in donkeys. Applied Animal Behaviour, submitted.

- Research to cover gaps in knowledge

Development of the Horse Grimace Scale (HGS) as a pain assessment tool in horses undergoing routine castration

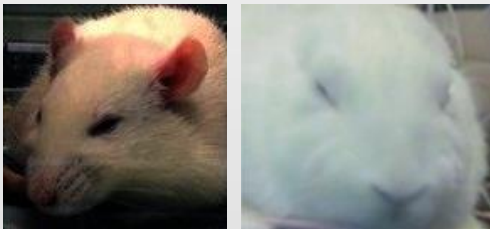
Pain assessment in horses is difficult,
no golden standard is available

There is a need of method to recognize whether a horse is in pain
after a routine procedure such as castration



➤ The approaches used in non verbalizing humans can provide a framework for animal pain assessment (*Grunau and Craig, 1987*)

➤ Facial expressions of pain have been already used to assess pain in other species (*Jordan et al., 2011*)

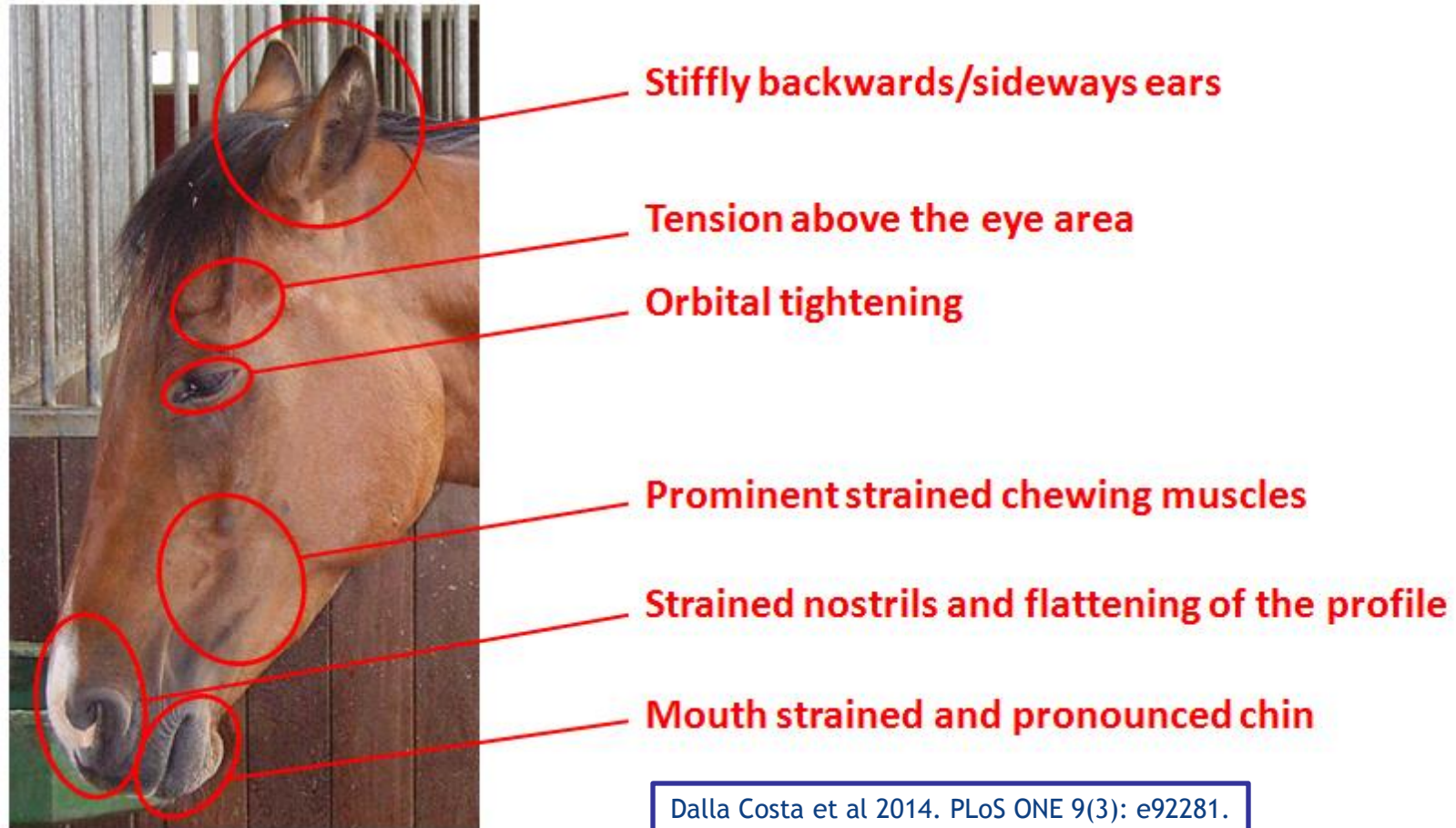


➤ This method resulted easy to learn and apply in practice as it takes advantages of the natural human instinct to look at the face (*Leach et al., 2011*)

- Research to cover gaps in knowledge

- Horse Grimace Scale

Based on the scientific study, the Horse Grimace Scale was developed, composed of six facial action units:



Dalla Costa et al 2014. PLoS ONE 9(3): e92281.

• Research to cover gaps in knowledge

Great interest for the HGS by the media and the public

CORRIERE DELLA SERA
MILANO / CRONACA

HOME CRONACA POLITICA VIDEO CULTURA CINEMA TEATRO CONCERTI BAMBINI L.A.M.I.

PER DUE ANNI, RICERCATORI EUROPEI HANNO CONFRONTATO GRUPPI DI CAVALLI SOTTOPOSTI AD ANESTESIA GENERALE PER ESSERE CASTRATI E ALTRI PER ESAMI NON INVASIVI.

Le 6 «smorfie» del cavallo rivelano la sua sofferenza

JAVMAnews PRACTICE May 15, 2014

Identificati i: occhi chiusi, con mento p...

HUFFPOST SCIENCE

Developed for horses

ach to assessing pain in horses on the basis of a Scale.

of training potential evaluators to use it.



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Development of facial expression pain scale

13/03/2014 by Sophie Barrington

A team of researchers from the University of Bristol, UK, and the University of Guelph, Canada, have developed and validated a facial grimace scale for horses. This new method allows researchers to assess the pain and welfare of horses during procedures.

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Die skala der Schmerzen

Die Augen sind teilweise oder komplett geschlossen. Wenn die Augen um mehr als die Hälfte geschlossen sind, sollte dies als „deutlich ausgeprägt“ oder mit „2“ bewertet werden.

Grade	Aspects to Consider	Points
0	Other signs not taken into account	0
1	Partially closed eyes	1
2	Partially closed eyes	2
3	Partially closed eyes	3
4	Partially closed eyes	4
5	Partially closed eyes	5
6	Partially closed eyes	6



- Research to cover gaps in knowledge

- LO on horse pain (www.animalwelfarehub.com)

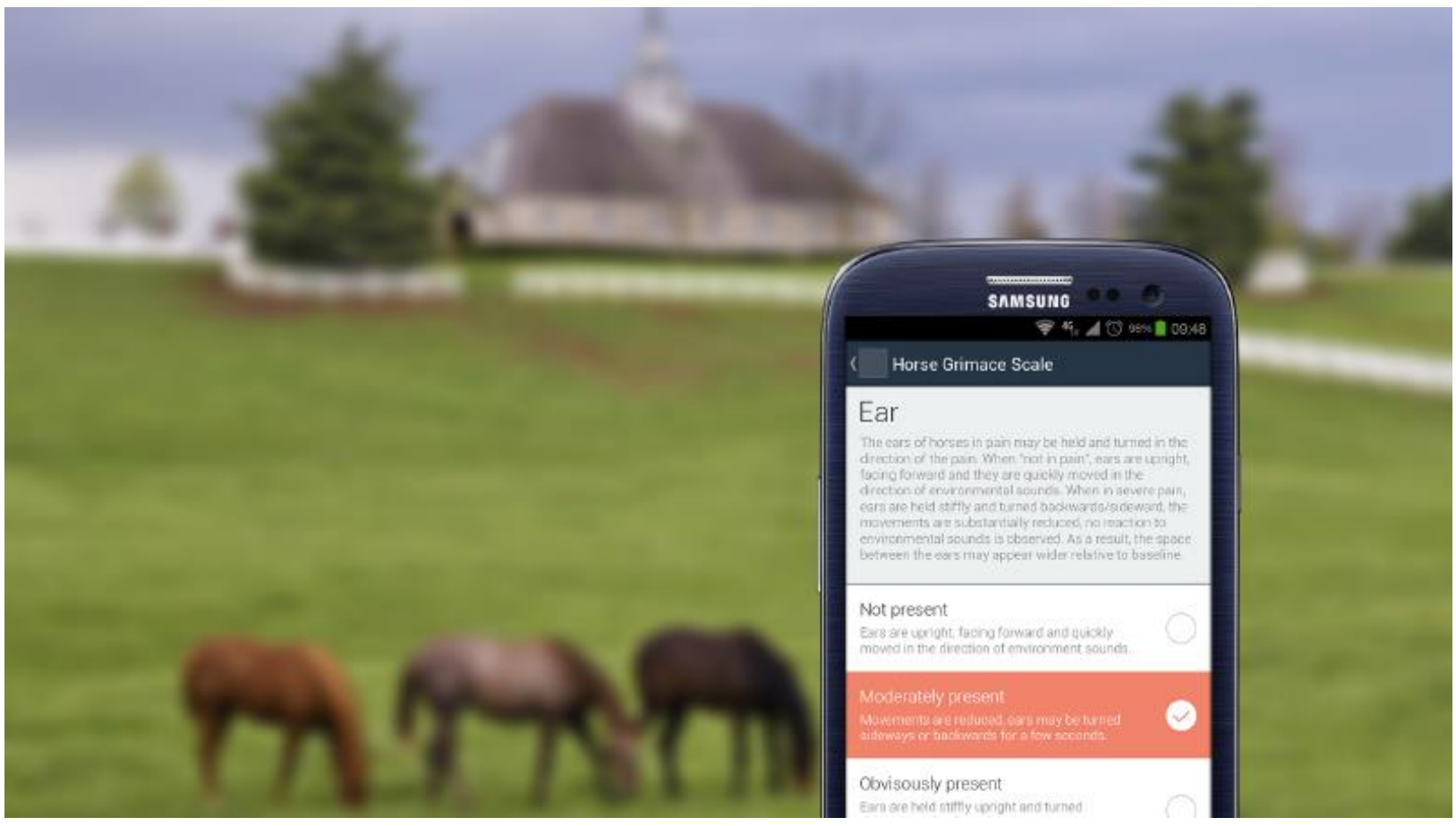
Enables the user to know more about horse pain assessment and the use of the Horse Grimace Scale

The screenshot shows the 'animal welfare science hub' interface. On the left, there are navigation options for 'Hub' and 'Sections', with 'AW Education' selected. The main content area displays 'Learning Objects' for 'Facial Expressions of Pain in Horses'. A video player shows a presentation slide titled 'awin presents the Learning Object Facial expression of pain in horses: the Horse Grimace Scale (HGS)'. Below the video, there are three interactive buttons: 'Facial expression of pain', 'Assess your knowledge!', and 'Learn more about pain... Recognizing a horse in pain'. To the right, a detailed view of the 'Stiffly backwards ears' indicator is shown, including a 'Points to consider' section and a 'Facial Coding Key' table.

Facial Coding Action Unit	Facial Coding Key	Scale
Ears stiffly backwards/sideways	Not Present	0
Orbital tightening	Moderately Present	1
Tension above eye area	Obviously Present	2
Prominent strained chewing chin	Don't know	9
Mouth strained and pronounced chin	Don't know	9
Stained nostrils and flattening of the profile	Pain Coding Key	Scale
Is this horse in pain?	Not Present	0
If so, please score the pain	Moderately Present	1
	Obviously Present	2
Submit	Don't know	9

- Research to cover gaps in knowledge

- HGS app (www.animalwelfarehub.com)



More than 500 downloads in 6 months



- Research to cover gaps in knowledge

A study on validity and reliability of on-farm tests to measure human-animal relationship in horses and donkeys



- Human-animal relationship plays an important role in animal welfare
- The literature review identified several HA relationship tests
- Lack of information regarding validity, reliability and on-farm feasibility

- Research to cover gaps in knowledge

- Behavioural tests differentiate between horse facilities with good or sub-optimal human-animal relationship
- Repeatability, reliability and on-farm feasibility



- Research to cover gaps in knowledge

Validation of a fear test in sport horses using infrared thermography



- Fearful temperament plays an important role in determining a long term negative emotional state and over-reaction to fear-eliciting stimuli

Finding appropriate indicators for assessing fearfulness in horses has important practical implications, not only for horse welfare, but also for human safety

- Research to cover gaps in knowledge



- Validity of a fear test in adult sport horses



- Thermography proved to be useful in assessing physiological reactions of fear in horses

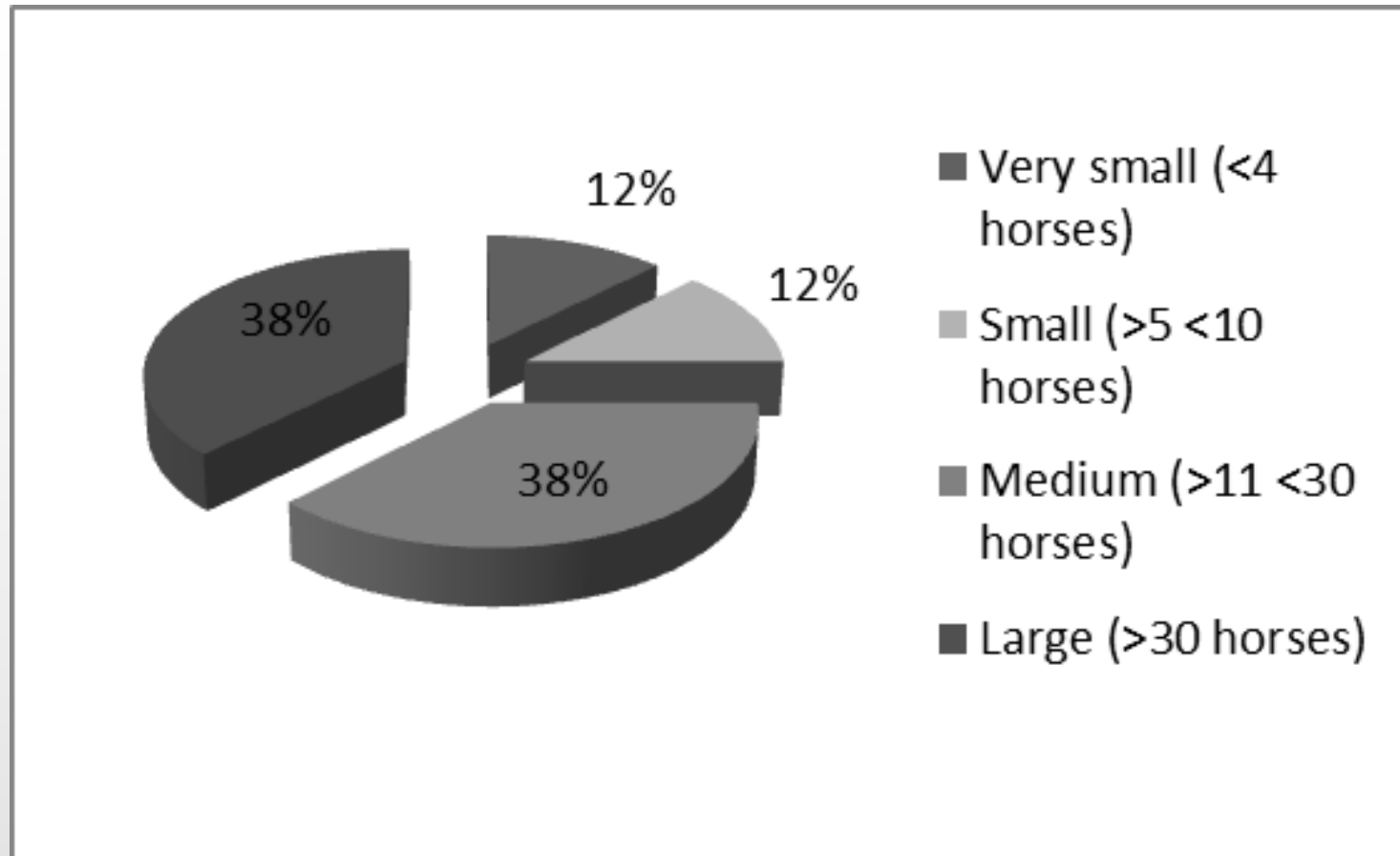
Dai et al 2014. Journal of Veterinary Behavior, 10, 128-136.

• Stakeholder consultation



Testing the prototype protocol on farm

Tested in 40 facilities (in Italy and Germany)



• The AWIN protocol

What is the aim of our protocol?

- To assess welfare in order to guide its improvement throughout Europe

Who are the users?

- Official assessors (trained owners) throughout Europe

How is the protocol?

- Two levels:
 - 1 Iceberg
 - 2 Comprehensive

• The AWIN protocol

First level	Second level
Valid and reliable indicators	
Iceberg indicators	More comprehensive assessment
Feasible in a short time	Feasible in a reasonable time
No or minimal handling required	
Short training of assessors	
Stakeholders' opinion	

• The AWIN protocol - First Level



02 LEVEL

01 LEVEL

Welfare assessment protocol for horses



Outside the box 3 min



Inside the box 2 min

1. Horse Grimace Scale
2. Stereotypies
3. Avoidance Distance
4. Voluntary Animal Approach
5. Body Condition Score
6. Hair coat condition
7. Abnormal breathing
8. Swollen joints
9. Integument alterations
10. Discharges
11. Prolapse
12. Social interaction
13. Signs of hoof neglect
14. Consistency of manure
15. Bedding
16. Box dimensions
17. Water availability
18. Exercise (questionnaire)

? What is the AWIN welfare assessment protocol for horses?
It is a science-based welfare assessment method, built on animal-based indicators, including pain indicators.

? What is it for?
It is intended to assess welfare of horses over than 5 year old, already used for different activities and housed in single boxes.

? Why using a two level approach strategy?
The AWIN welfare assessment protocol offers, as a first level, a quick screening, consisting of a selection of robust and feasible animal-based indicators. Depending on the outcome of the first level assessment, a second level, consisting of more comprehensive and in depth assessment, may be recommended.

? Do I need to assess all the horses?
In the first level of the assessment, sampling of horses is needed.

? How can I collect and analyse data?
An interactive apps to facilitate data collection, data storage and data analysis is available on Google Play Store and App Store.

- Sampling of horses is needed
- An interactive app for data collection, data storage and data analysis

• The AWIN protocol - First Level

Farm size - number of horses over than 5 year old	Suggested sample*
1-14	All animals
15-19	13
20-24	16
25-29	19
30-34	21
35-39	24
40-44	26
45-49	28
50-59	29
60-69	32
70-79	35
80-89	37
90-99	39
100-124	41
125-149	44
150-174	47
175-199	49
>200	51

**The sample size is calculated for an expected variation in data of 0.5, at the level of confidence of 0.9 and a precision of the estimate (δ) of 0.1*

- The AWIN protocol

From 1st to 2nd level?

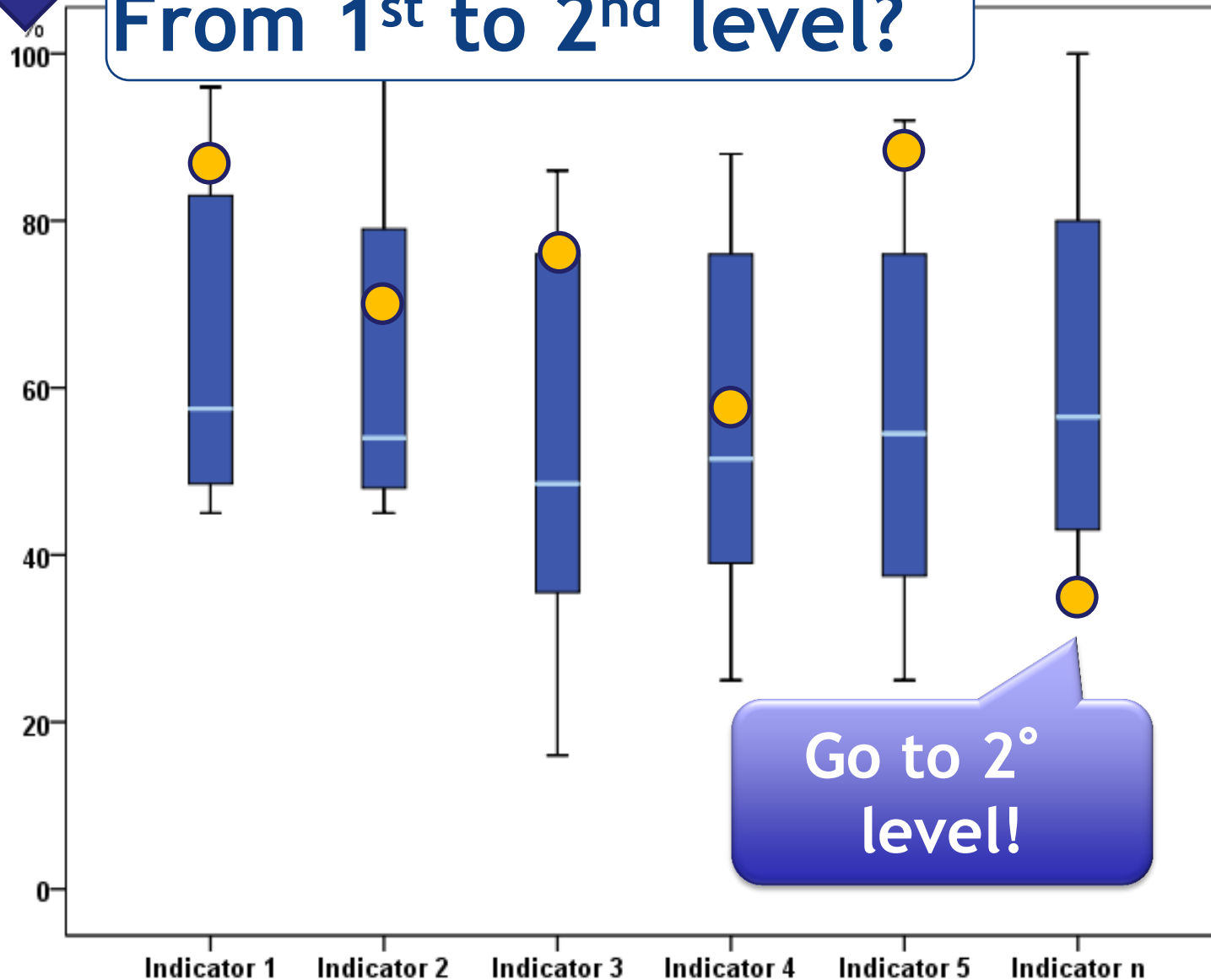


When at least one of these conditions is satisfied:

1. non compliance with the current legislation;
2. the within-farm proportion of animals meeting a given criterion is lower than the proportion of animals observed in the worst 5% of the farms of the reference population.

- The AWIN protocol

From 1st to 2nd level?



Go to 2° level!



• The AWIN protocol - Second Level

Welfare assessment protocol for horses

02 LEVEL

awin
ANIMAL WELFARE
INDICATORS

01 LEVEL



Outside the box 3 min



Inside the box 4 min



Handling required 3 min

1. Horse Grimace Scale
2. Coughing
3. Stereotypies
4. 1st QBA observation
5. Avoidance Distance
6. Voluntary Animal Approach
7. Forced Human Approach
8. 2nd QBA observation
9. Body Condition Score
10. Hair coat condition
11. Abnormal breathing
12. Discharges
13. Prolapse
14. Bedding
15. Consistency of manure
16. Social interaction
17. Box dimensions
18. Water availability (Bucket test)
19. Lameness
20. Integument alterations
21. Swollen joints
22. Signs of hoof neglect
23. Lesions at mouth corners
24. Fear test
25. Exercise (questionnaire)

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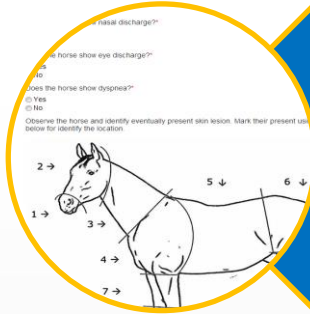
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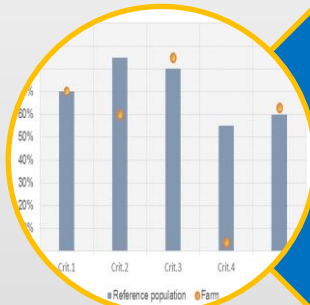
• Data collection and output



Data collection:
quick and reliable



Immediate feedback
to the farmer



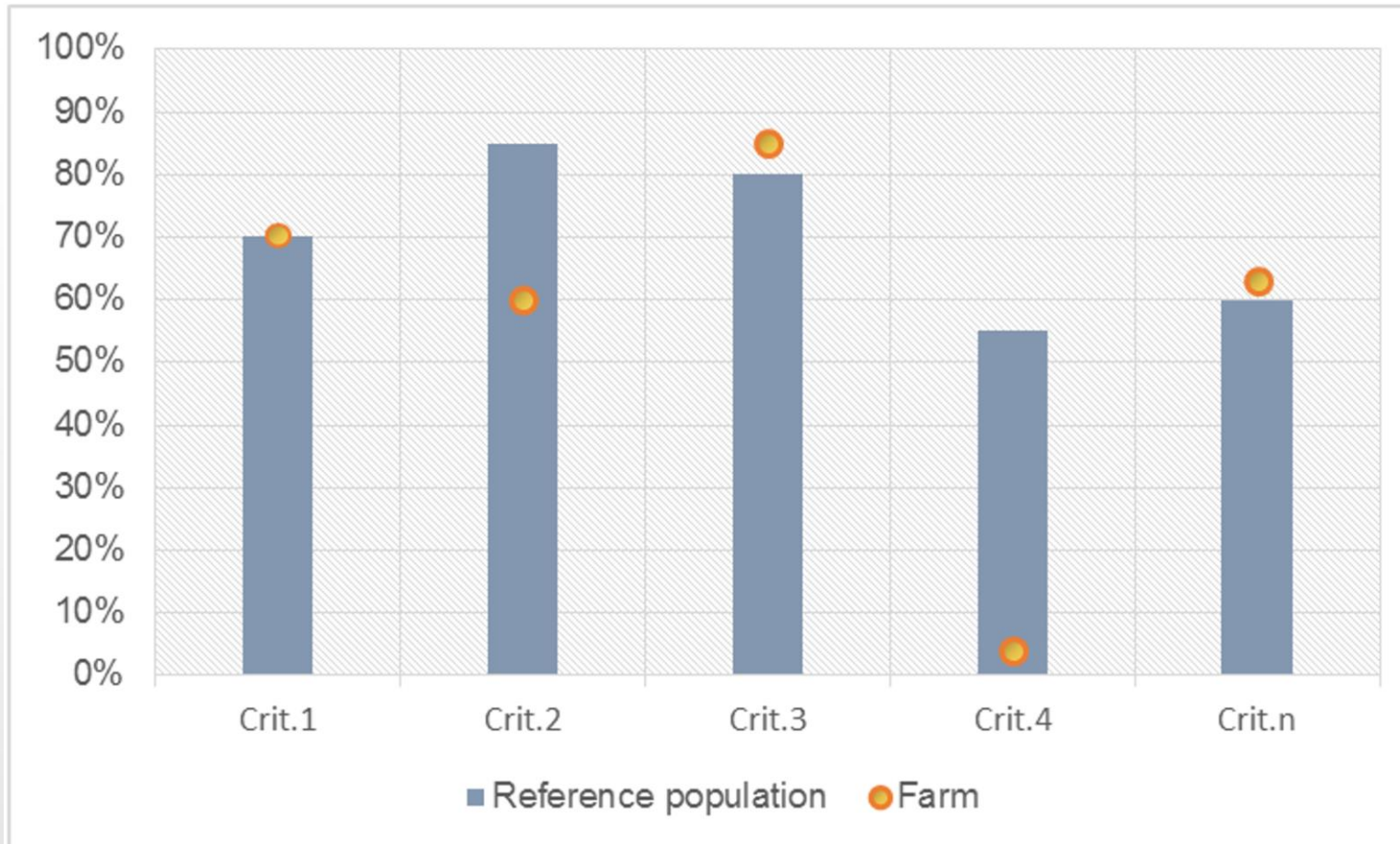
Type of output



AWINHorse app
(on Google Play store)

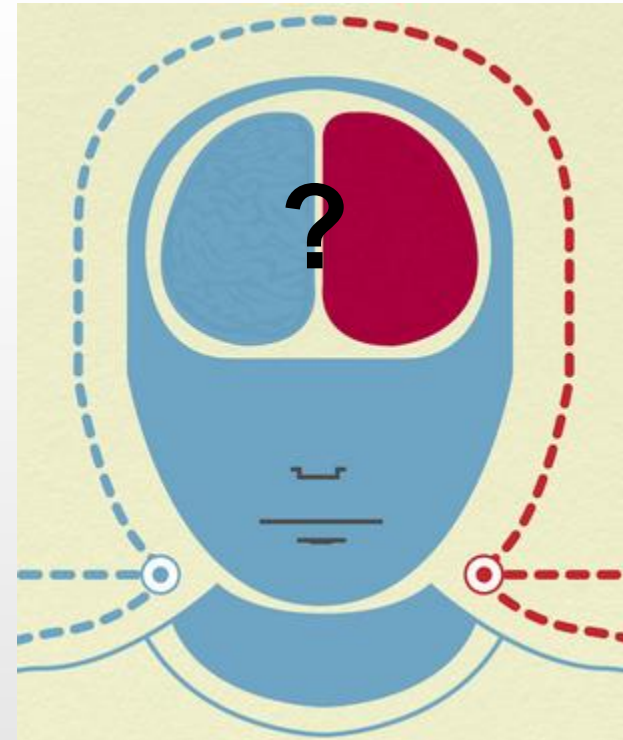


• Data collection and output

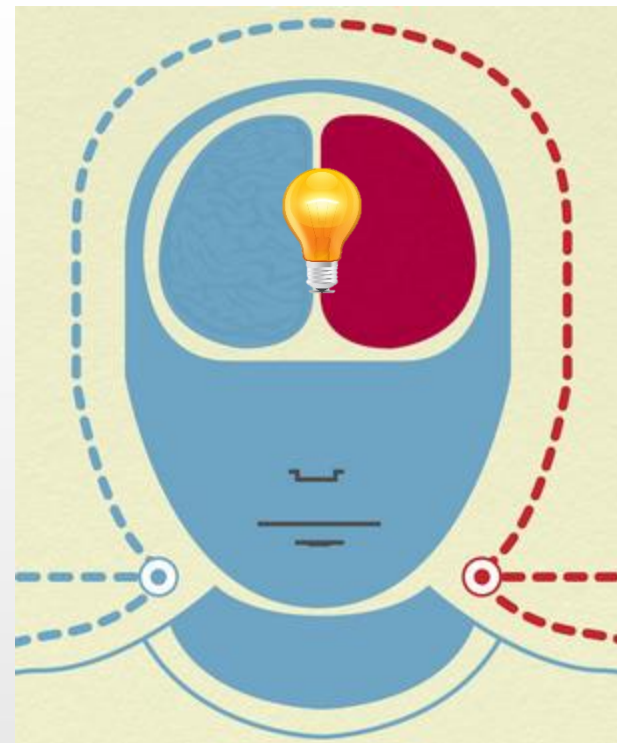
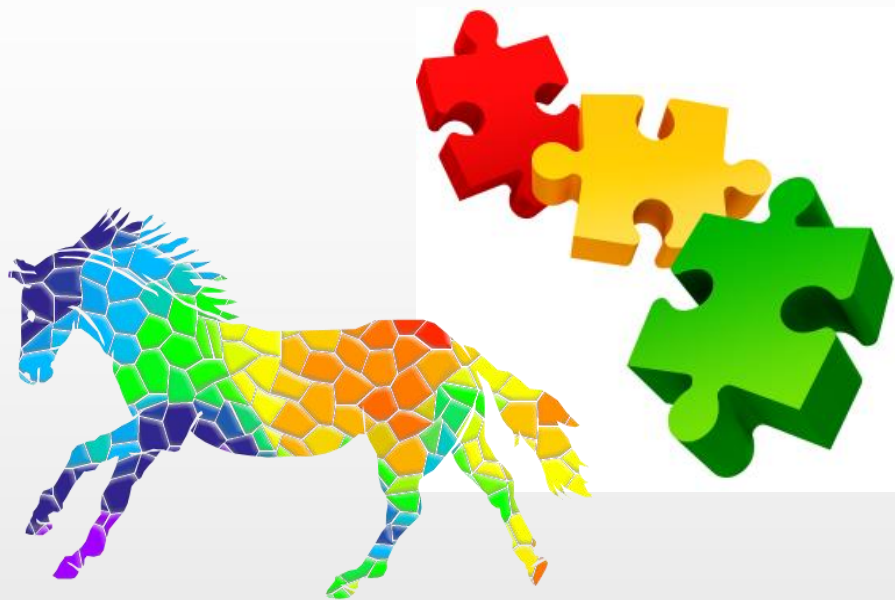


Challenges

- Better reference population
- Adaptation to specific management situation
- Neuroscience studies to evaluate affective states



Solutions



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration



Thank you!

