Assessment of fear and human animal relationship in finishing pigs at the slaughterhouse

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INTRODUCTION

	Welfare Criteria		Measures
Good feeding	1	Absence of prolonged hunger	
	2	Absence of prolonged thirst	Water supply (number of drinkers, state)
Good housing	3	Comfort around resting	Density and flooring of lorries Density and flooring of lairage pens
	4	Thermal comfort	Percentage of animals shivering Percentage of animals panting Degree of social thermoregulation /huddling Environmental temperature
	5	Ease of movement	Percentage of pigs that slip during unloading Percentage of pigs that fall during unloading
Good health	6	Absence of injuries	Lameness score Wounds on body
	7	Absence of disease	Percentage of sick animals on arrival Percentage of dead animals on arrival Slaughter checks (pneumonia, pleurisy, pericarditis, white spots in the liver)
	8	Absence of pain induced by management procedures	Stunning effectiveness (presence of corneal reflex, righting reflex, rhythmic breathing, vocalisations)
Appropriate behaviour	9	Expression of social behaviours	
	10	Expression of other behaviours	
	11	Good human-animal relationship	High pitched vocalisations when driven to the stunning area
	12	Absence of general fear	Reluctance to move during unloading Turning back during unloading

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INTRODUCTION

Fear and anxiety are two emotional states induced by the perception of a danger or a potential danger, respectively, that threaten the integrity of the animal.

Suddenness, unfamiliarity and unpredictability are the key features of a predatory attack. So, these factors should be considered when the responsiveness to a fearful stimulus is studied in pigs.

The aim of the communication is to present:

-Validation of behavioural indicators of general fear in pigs.

-Inter-observer repeatability of fear measures on farm and slaughterhouse

-Feasability and analysis of results of fear measures in commercial conditions.

-Feasability and analysis of results of human animal relationship in commercial conditions.

VALIDATION

1. Based on approach-avoidance behaviour.

2. Useful for different novel stimuli type and age of animals.

3. Use of anxyolitics to reduce fear in treated animals.

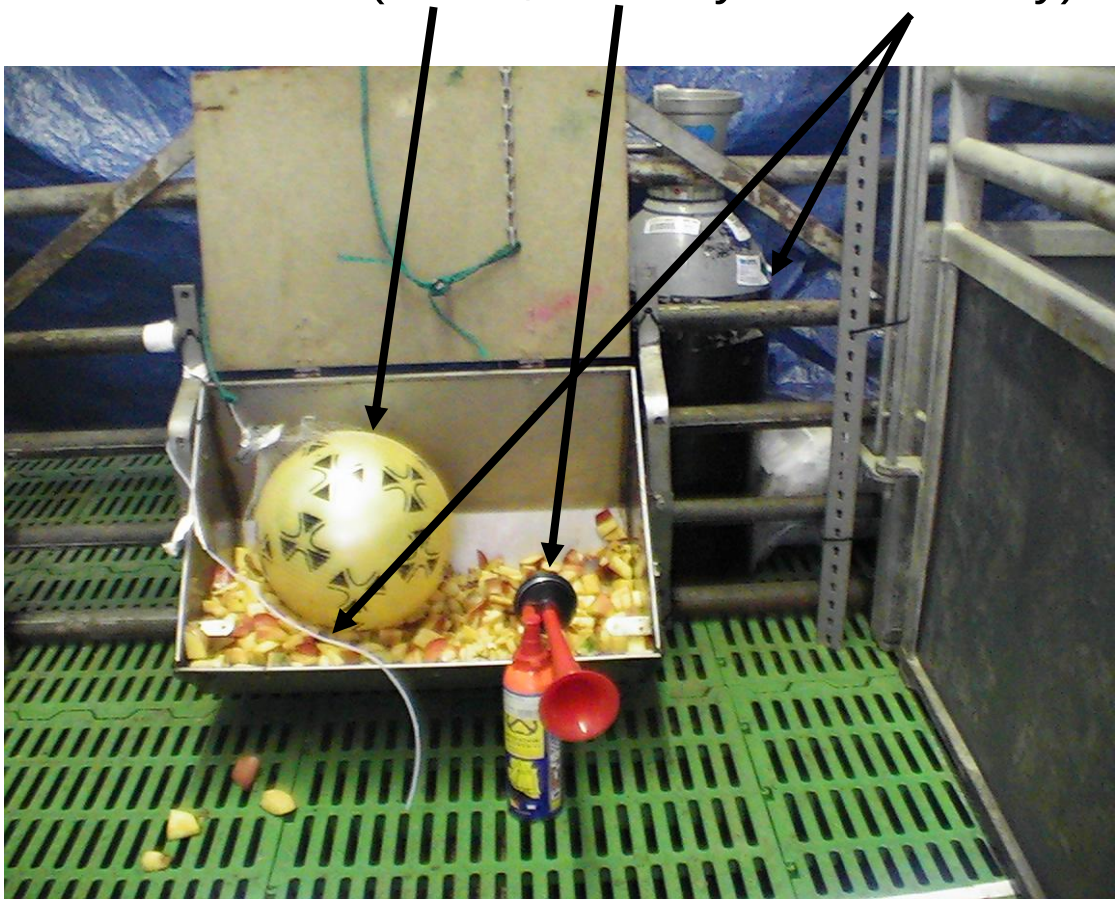
4. Intramuscular injection of 0.15-0.20 mg/kg BW of midazolam

METHODS

1. 32 post-weaning pigs (35 kg) and 32 finishing pigs (100 kg).

2. A trough with apples in pieces.

3. Three novel stimulus (visual, auditory and olfactory).



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1. Three groups of 10 animals (blue, green and red).

2. Animals were housed in groups of two individuals.

3. Inside each pen, 1 animal was control and the other treated (midazolam).

4. Three types of session (training, refresher and treatment sessions).

		Green Group	Red Group	Blue Group
Day 1 and 2		Training	Training	Training
Day 3 and 6		Training	Training	Training
Day 7		Visual	Refresher	Refresher
Day 8		Refresher	Auditory	Refresher
Day 9		Refresher	Refresher	Olfactory
Day 10 and 11		Refresher	Refresher	Refresher
Day 12		Refresher	Visual	Refresher
Day 13		Refresher	Refresher	Auditory
Day 14		Olfactory	Refresher	Refresher
Day 15 and 16		Refresher	Refresher	Refresher
Day 17		Refresher	Refresher	Visual
Day 18		Auditory	Refresher	
Day 19			Olfactory	

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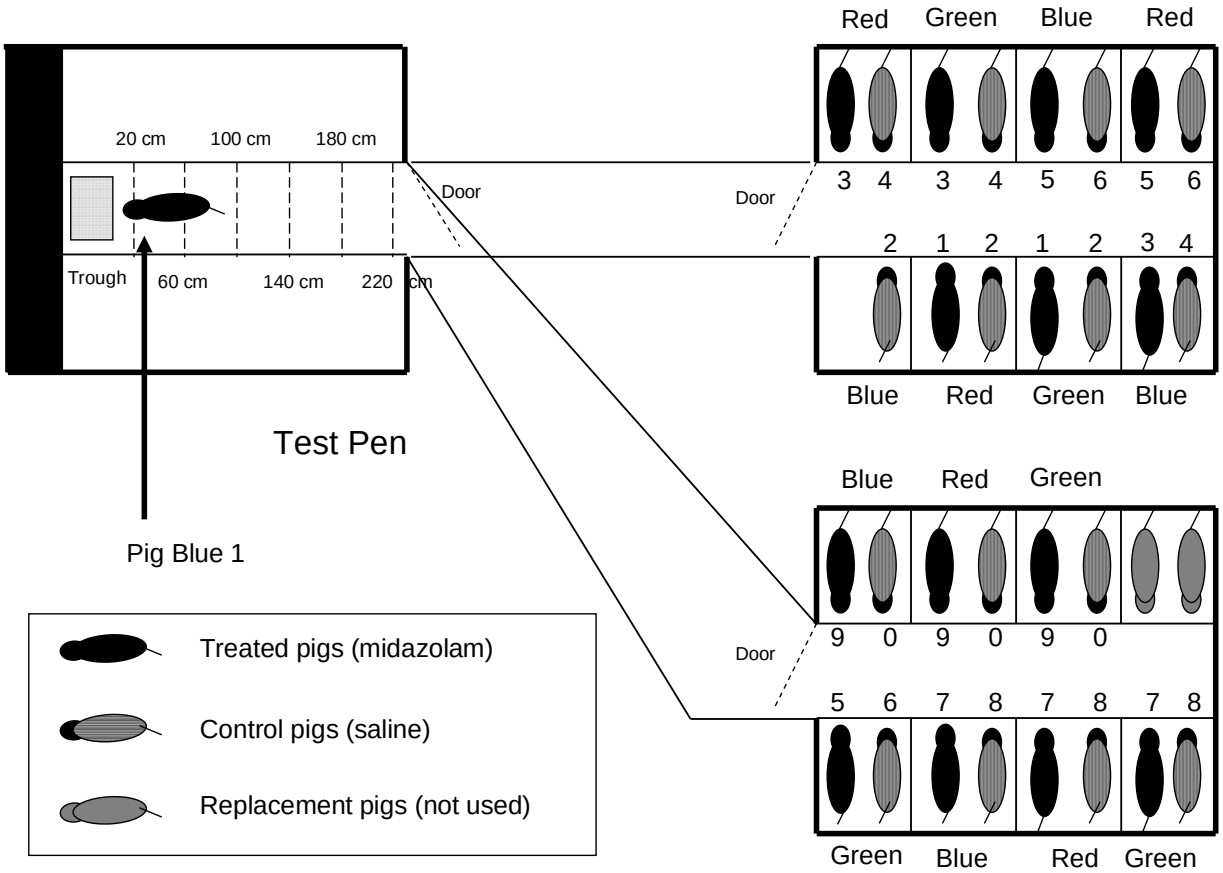
Animals were inside the test pen during 2.5 minutes.

The trough was opened during 2.0 minutes.



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The following behaviours were scored:

Presence of feeding behaviour: ate or not apples.

Approach/avoidance distance to the trough: white lines.

Position of the animal respect to the trough (head, lateral, back).

General activity: number of lines crossed.

Reluctant to move: pigs stopping and not exploring during 2 s.

Turning back: quick change of direction.

Retreat attempt: pig backing away.

For statistical analysis, Proc Genmod of SAS was used.

Significance was fixed at $P < 0.05$

Midazolam treated

Few white lines crossed

Exploring/playing behaviour

Feeding behaviour

Control pig

General activity increased

Retreat attempts

Turning back

Escape attempts

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General activity

	Post-weaning pigs		Finishing pigs	
	Midazolam	Control	Midazolam	Control
Auditory stimulus	10.4 ± 3.84	23.0 ± 3.84	13.3 ± 3.50^{b}	28.2 ± 3.50^{a}
Olfactory stimulus	17.3 ± 4.42^{b}	44.7 ± 4.42^{a}	13.7 ± 4.16	27.8 ± 4.16
Visual stimulus	8.27 ± 3.84^{b}	26.9 ± 3.84^{a}	13.1 ± 4.56	23.6 ± 4.56

In post-weaning pigs, the turning back movements were more associated with the olfactory stimulus, while the retreat attempt movements was higher after visual than auditory stimulus.

In finishing pigs, visual stimulus induced more retreat attempts and less turning back movements than auditory and olfactory stimuli.

In front of a visual stimulus, there were observed more retreat attempts in finishing pigs than post-weaning pigs.

No differences were found between stimuli neither age for reluctant to move behaviour.

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Reluctant to move

	Post-weaning pigs		Control pigs	
	Midazolam	Control	Midazolam	Control
Auditory stimulus	0.6 ± 0.42[b]	2.8 ± 0.42[a]	0.3 ± 0.39[b]	2.4 ± 0.39[a]
Olfactory stimulus	0.9 ± 0.38[b]	1.7 ± 0.38[a]	0.5 ± 0.32[b]	1.6 ± 0.32[a]
Visual stimulus	0.2 ± 0.36[b]	2.8 ± 0.36[a]	0.6 ± 0.46[b]	2.1 ± 0.46[a]

Turning back

	Post-weaning pigs		Finishing pigs	
	Midazolam	Control	Midazolam	Control
Auditory stimulus	0.4 ± 0.26[b]	1.1 ± 0.26[a]	0.3 ± 0.22[b]	1.2 ± 0.14[a]
Olfactory stimulus	0.7 ± 0.36[b]	2.7 ± 0.36[a]	0.1 ± 0.25[b]	1.1 ± 0.25[a]
Visual stimulus	0.2 ± 0.27[b]	1.1 ± 0.27[a]	0.1 ± 0.26	0.6 ± 0.19

Retreat attempts

	Post-weaning pigs		Finishing pigs	
	Midazolam	Control	Midazolam	Control
Auditory stimulus	0.2 ± 0.27[b]	1.1 ± 0.27[a]	0.3 ± 0.36[b]	1.5 ± 0.36[a]
Olfactory stimulus	0.5 ± 0.33[b]	1.4 ± 0.33[a]	0.6 ± 0.42[b]	1.6 ± 0.42[a]
Visual stimulus	0.6 ± 0.36[b]	1.8 ± 0.36[a]	1.5 ± 0.58	2.0 ± 0.58

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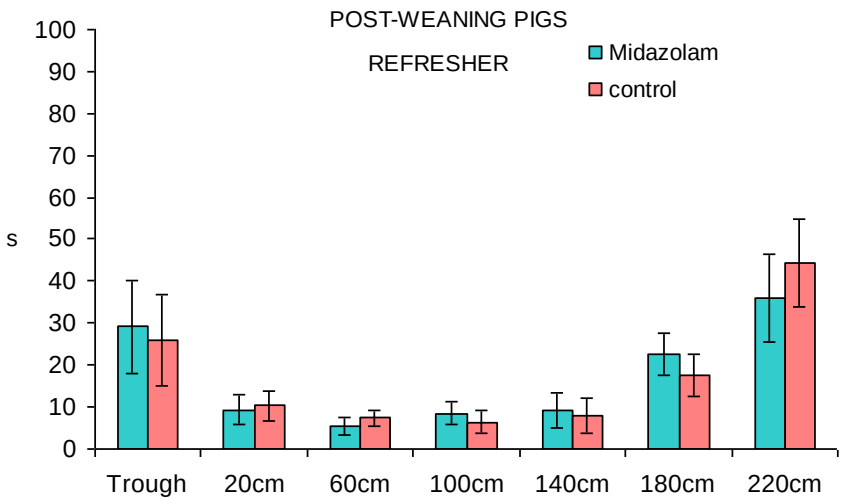
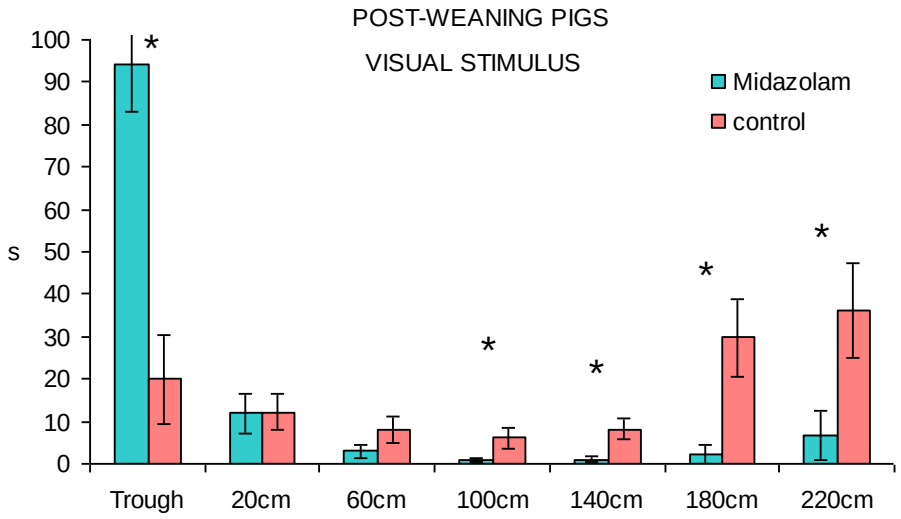
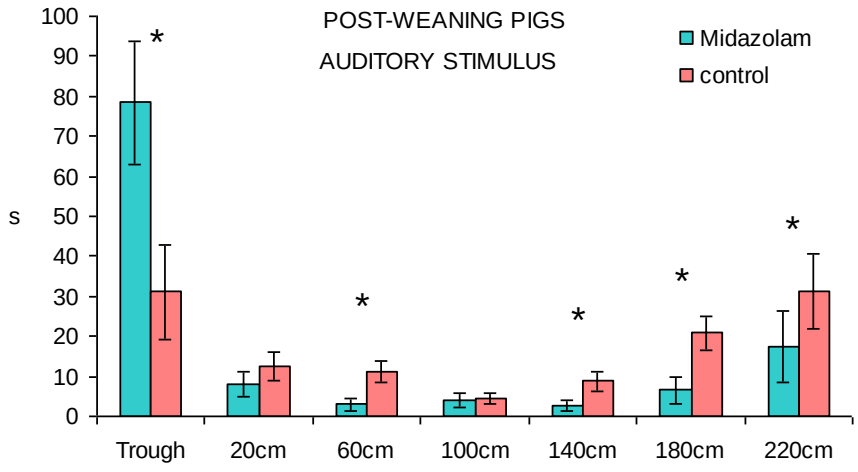
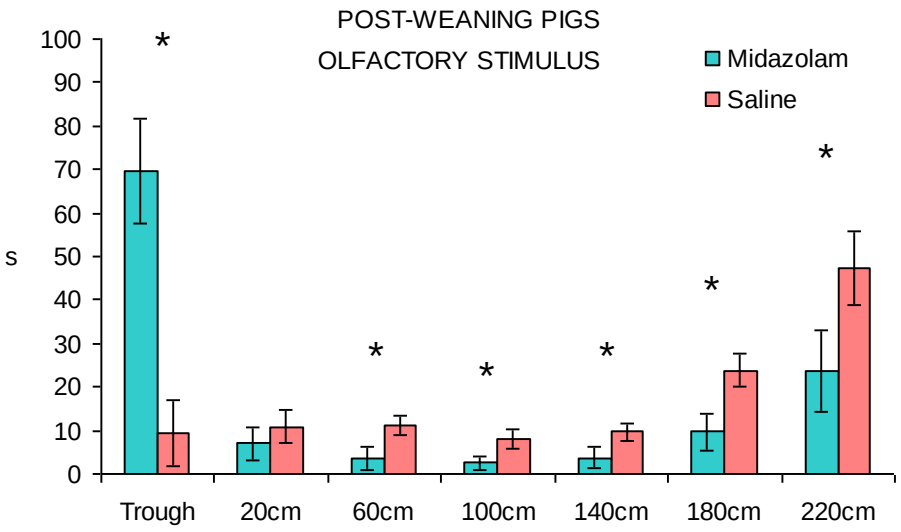
DISTANCE TO THE TROUGH









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CONCLUSIONS

When subjected to fear stimuli, midazolam treated animals reduced the distance to the trough, the general activity, and the number of reluctant to move postures, and turning back and retreat attempt movements in comparison to control pigs.

In a practical ground, reluctant to move and turning back movements could be valid measures to assess behaviourally fear in pigs.

However, only the reluctant to move posture showed no differences between ages neither stimulus type.

Midazolam dosages of 0.15 mg/kg for pigs around 100 kg body weight could reduce fear in animals, being a useful tool for further studies.

ON FARM ASSESSMENT OF GENERAL FEARFUL

What we could use?

Novel object

What we could measure?

Approaching behaviour and vigilance (reluctance to move)

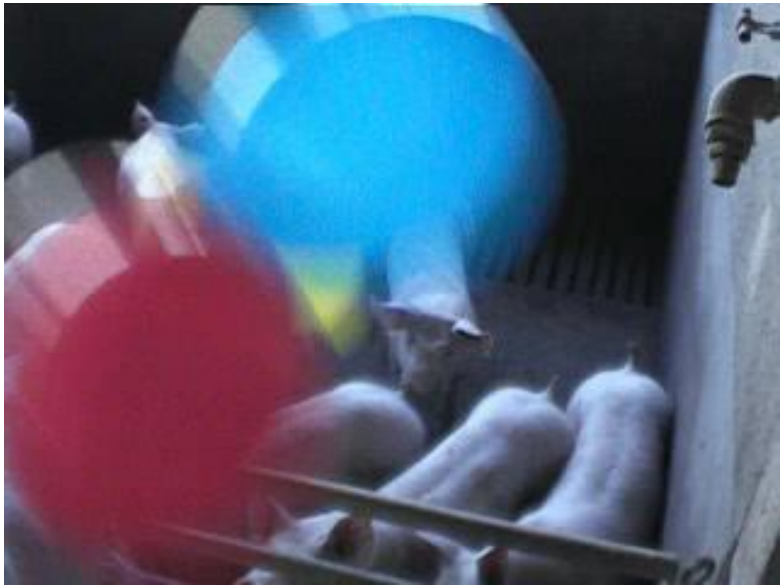
How we carried out the study?

Up to 4 observers visited in pairs 18 farms with different buildings. 321 pens were assessed by means of three colour globes

What did we pretend to analyse?

Intra farm repeatability higher than inter farm repeatability
High correlations between observers

RESULTS



RESULTS

Time taken to touch the ballons ranged from less than 5 s to 362 s

Mean time was 27.1 ± 2.52 s

Farm with the lowest time, presented a time of 6.8 ± 0.66 s

Farm with the higest time, presented a time of 73.3 ± 24.35 s

Differences between farms were found in 92 of 151 comparisons.

Differences between buildings in the same farm were only found in one farm and differences between pens in the same building only in two farms.

Pigs touched in a 36% of the cases the red ballon, in a 35% the blue, and in 29% de yellow.

Correlations between observers were between 0.74 and 0.96

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RESULTS

Percentage of animals whaching the ballons each 10 seconds during 2 minutes ranged from 0 to 92%

Mean percentage was 24.0 ± 0.20 s

Farm with the lowest values, presented a percentage of 12.7 ± 0.47%

Farm with the higest values, presented a percentage of 32.2 ± 0.82%

Differences between farms were found in 126 of 151 comparisons.

Differences between buildings were found in all farms except two.

Differences between pens in the same building were found in 33 of the 39 buildings assessed.

Correlations between observers were between 0.59 and 0.77

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Study of feasability and repeatability at the slaughterhouse

Six to seven observers in the unloading area, observing and assessing in the same animals:

- Reluctance to move
- Retreat attempts
- Turning back
- Vocalisations

Slaughterhouse	Country	Type of ramp	Number of animals
1	Belgium	Metal/adjustable	460
2	Belgium	Rubber/adjustable	1034
3	Spain	Concrete/not adjustable	479
4	Spain	Metal/adjustable	659

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Reluctance to move

OBSERVER	SL-1	SL-2	SL-3	SL-4
1	13%	8%	5%	6%
2	10%	7%	4%	7%
3	6%	4%	6%	8%
4	13%	5%	3%	7%
5	9%	5%	8%	6%
6	8%	4%	6%	11%
7	15%	5%		

Retreat attempts

OBSERVER	SL-1	SL-2	SL-3	SL-4
1	4%	2%	1%	3%
2	4%	1%	1%	1%
3	0%	1%	2%	3%
4	1%	0%	2%	3%
5	0%	2%	1%	1%
6	1%	0%	2%	3%
7	2%	0%		

Turning Back

OBSERVER	SL-1	SL-2	SL-3	SL-4
1	4%	3%	5%	5%
2	6%	2%	3%	6%
3	3%	2%	5%	9%
4	3%	2%	4%	4%
5	5%	0%	1%	7%
6	2%	1%	7%	9%
7	5%	1%		

Vocalisations

OBSERVER	SL-1	SL-3	SL-4
1	6%	3%	2%
2	7%	1%	1%
3	1%	8%	4%
4	0%	2%	2%
5	4%	3%	2%
6	3%	10%	1%
7	5%		

Mean Spearman rank correlations found between observers were:

r= 0.31 for reluctance to move (the highest 0.60)
r= 0.25 for retreat attempts (the highest 0.65)
r= 0.43 for turning back (the highest 0.61)
r= 0.39 for vocalisations (the highest 0.78)

When the same videos were scored by 20 observers from videotapes, the correlations increased to a mean of 0.54 for reluctance to move.

According to the observers, 4 parameters at the same time were too much and caused mistakes. It was decided to reduce the four to two.

Vocalisations or reluctance to move?

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Second study

Five observers in the unloading area, observing and assessing in a total of 370 animals:

- Reluctance to move
- ~~Retreat attempts~~
- Turning back
- ~~Vocalisations~~

Mean Spearman rank correlations found between observers were:

r= 0.67 for reluctance to move
r= 0.74 for turning back

In the slaughterhouse assessed,

Reluctance to move was scored in a range from 5.5 to 8.0%
Turning back was scored in a range from 1.3 to 2.1%

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METHODS AND RESULTS

UNLOADING

26 slaughterhouses of Spain, Belgium, Brasil and Chile

Reluctant to move

Turning back

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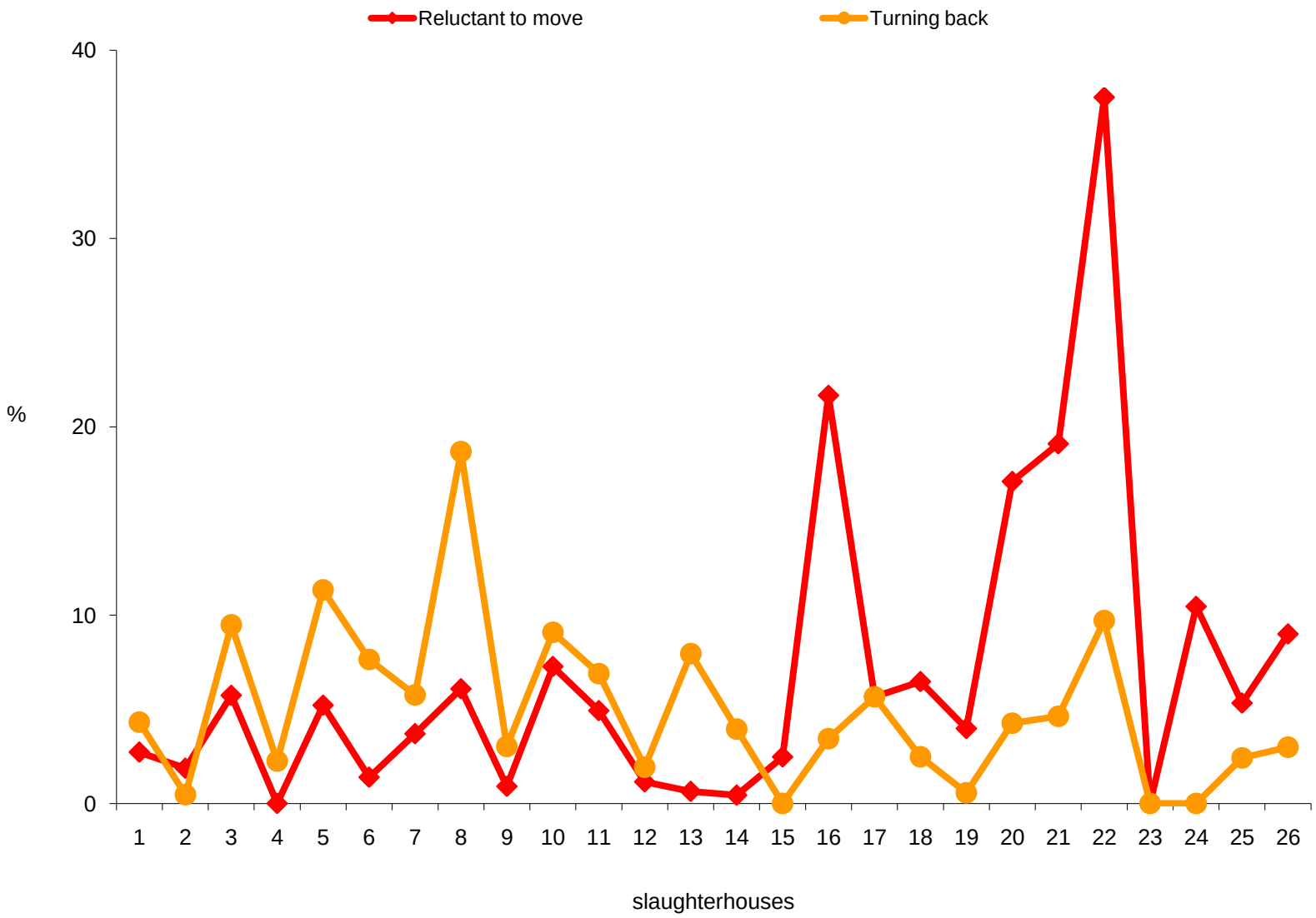
FEAR DURING UNLOADING



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FROM LAIRAGE TO STUN

HIGH PITCHED VOCALISATIONS

One-Zero

	Vocalization	
Interval	HPV	no HPV
1		X
2	X	
3	X	

Instant

	Vocalization		Modifier	
20s	yes	no	single	multi
1		X		
2	X			X
3		X		

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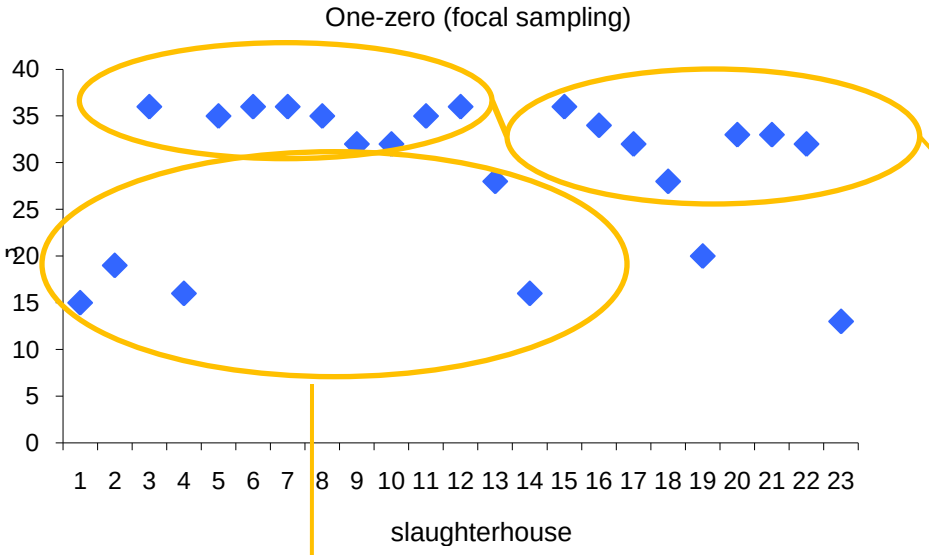
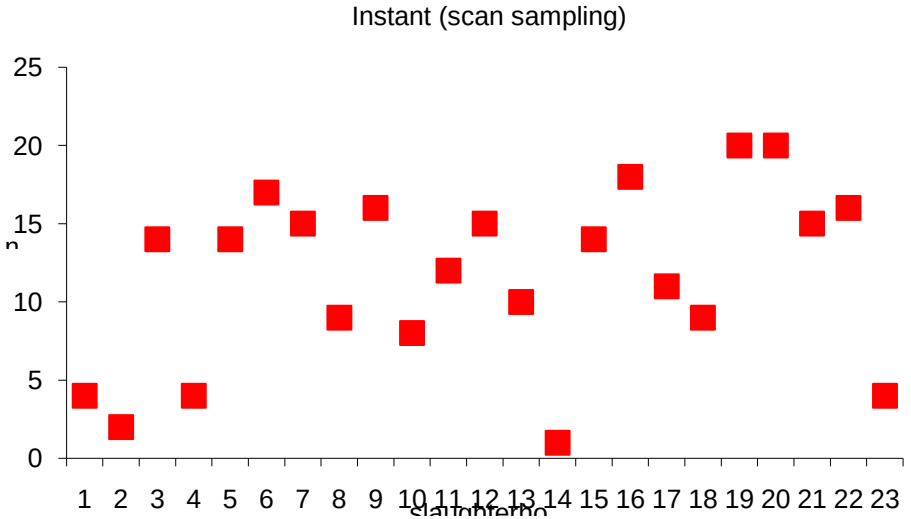

One-zero (focal sampling)
40
35
30
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
slaughterhouse


Instant (scan sampling)
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

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Thanks for your attention

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