



Animal welfare indicators - pigs

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Structure

- Definitions
- Feed & water
- Environment
- Health and pain
- Behaviour
- General indicators





Types of animal welfare indicators

- Resource based indicators
- Management based indicators
- Animal based indicators



Types of animal welfare indicators

- Resource based indicators
 - Management based indicators
 - Animal based indicators
- } Input indicators
- } Output indicators



Welfare assessment protocols

Name	Output	Input	Integrated value	Abs. req.	Reference
Welfare Quality	X	(X)	X		Welfare Quality 2009
KBTL	X	(X)			Schrader et al 2019
TGI 35L		X	X		Bartussek 1995
RSPCA assured		X		X	RSPCA 2016
Beter Leven		X		X	Beter Leven 2020



Indicators

- Indicator should be valid, i.e. welfare relevant
(is lameness related to pain?)
- Measures should be repeatable
- Measures should be feasible
- Measures should be well correlated to the indicator
(is activity a good measure of lameness?)



Feed and water

- Body condition score
 - Indicative of long term hunger,
 - (hunger is affected by type of restriction)
 - Poor repeatability with human observer
 - Possibility of video/AI registration



WQ NEN 2009



Feed and water

- Access to roughage
 - Less stereotypic behaviour
 - More normal feeding pattern
 - (decreases risk of gastric ulcers)
 - But – still hungry





Feed and water

- Weaning age
 - Relevant measure
 - Intestine not ready until after 6 weeks
 - Hard to check





Feed and water

- Number of working drinkers
- Recommendations (1/10 pigs), but poor evidence
- No strong effect of type of drinkers





Feed and water

Measure	Animal group	Welfare relevance	Reproduc.	Practicality
Body condition	Sows, pigs	*	*	***
Roughage	Sows/pigs	***/**	**	***
Weaning age	Piglets	**	***	**
No. func. drinkers	Sows/pigs	*	*/***	*/***
Type of drinkers	Sows, pigs, piglets	*	***	***
Water quality	Sows, pigs, piglets	**	*	**





Environment

- Stocking density
 - Prevention of natural behaviour
 - Increased risk of competition
 - Reduced resting area





Environment

- Flooring/Slatted floors
 - Proportion of slatted floors
 - Quality of slatted floors
 - Affects bursitis
 - Affects length of fights





Environment

- Crates
 - Restricted movement
 - Reduced nest building
 - Affects piglet feeding
 - Piglet mortality if small box





Environment

- Thermal comfort - shivering and panting
 - Shivering – newborn piglet issue
 - Panting – primarily sows and during transport
 - Good repeatability (short term)



Welfare Quality



Environment

- Air quality
 - Ammonia and particles
 - Important
 - Very difficult to measure at pig level





Environment

- Enrichment
 - ‘ingestible’, ‘odorous’, ‘chewable’, ‘deformable’ and ‘destructible’
 - Rooting behaviour





Environment - Enrichment

Ranking of materials

Beattie et al. (1998)	Pedersen et al. (2005)	Madsen (2001)	van de Weerd et al. (2003a)	Day et al. (2002)	Ladewig and Matthew (1996)	Arey and Maw (1995)	Jensen and Pedersen (2006)
			carrots in a string			Beets	maize silage+straw
			coconuts in halves				
peat	peat branches		compost		wood shavings		compost
mushroom compost							wood chips
sawdust					sawdust		rope
sand					straw bedding		seed grass hay
bark chips							
straw	unchopped straw	unchopped floor	straw, floor			straw	
	chopped straw		chopped straw	chopped straw	chopped straw		chopped straw
		Alfalfa					
		straw, dispenser			sand		
		rope		destructible vitamin	straw, dispenser		
		rubber cosh	rope	with			
			paper				
			sand				
		beam					
				chain			
concrete							



Environment

- Manure
 - Thermal comfort (too hot)
 - Diarrhea





Environment

- Outdoor access





Environment

Measure	Animal group	Welfare relevance	Reproduc.	Practicality
Stocking density	Sows, pigs, piglets	***	***	***
Flooring	Sows, pigs, piglets	***	***	***
Crates	Sows	**	**	**
Thermal comfort	Sows, pigs, piglets	**	***/*	**
Air quality	Sows, pigs	***	*	*
Enrichment	Sows, pigs, piglets	***	***	***
Manure	Sows, pigs	**	**	***
Outdoor access	Sows, pigs, piglets	**	***	***





Health and pain

- Lameness
 - High repeatability between observers
 - Low repeatability over time





Health and pain

- Wounds on body
 - Aggression:
 - At mixing - head/neck region
 - Bullying – back region





Health and pain

- Vulva lesions
 - Aggression around feeding





Health and pain

- Mortality
 - Difficult measure
 - Differing definitions for piglets
 - Culling may be welfare positive





Health and pain

- Respiratory problems
 - Better measure of air quality
 - Lung lesions detected at slaughter
 - Video-AI recordings





Health and pain

- Prolapse
 - Cause of sow culling in 1-2% of cases





Health and pain

- Enteric problems
 - Weaning diarrhea





Health

Measure	Animal group	Welfare relevance	Reproduc.	Practicality
Lameness	Sows, pigs, piglets	***	*	*
Wounds on body	Sows, pigs	***	**	**
Vulva lesions	Sows	***	*	*
Mortality	Sows, pigs, piglets	***	**	***
Respiratory problems	Sows, pigs	***	***	***
Prolapse	Sows, pigs	**	*	***
Enteric problems	Sows, pigs	***	*	**
Metritis and mastitis	Sows (piglets)	***	*	*
Hernias	Sows, pigs, piglets	*	***	***
Pain face	Sows, pigs, piglets	***	*	*



Pain

Measure	Animal group	Welfare relevance	Reproduc.	Practicality
Nose ringing	Sows, pigs	**	***	***
Tail docking	Piglets	**	***	***
Castration	Piglets	**	***	**
Teeth clipping	Piglets	**	***	***





Behaviour

- Affiliative behaviour
 - No obvious behaviours
 - Nose-nose contact





Behaviour

- Aggression
 - Hard to observe – look for wounds instead
 - Mixing
 - Feed provision system





Behaviour

- Nest building
 - Difficult to control
 - Starts shortly before farrowing
 - Way of provisioning material plays important role





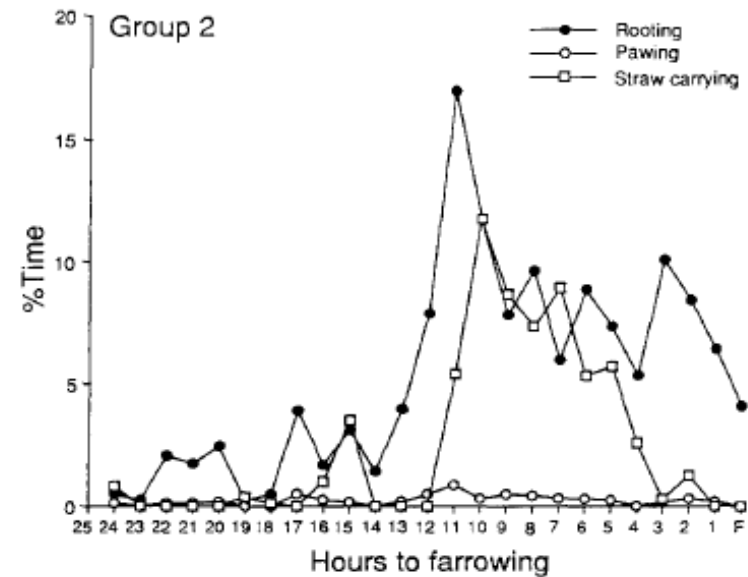
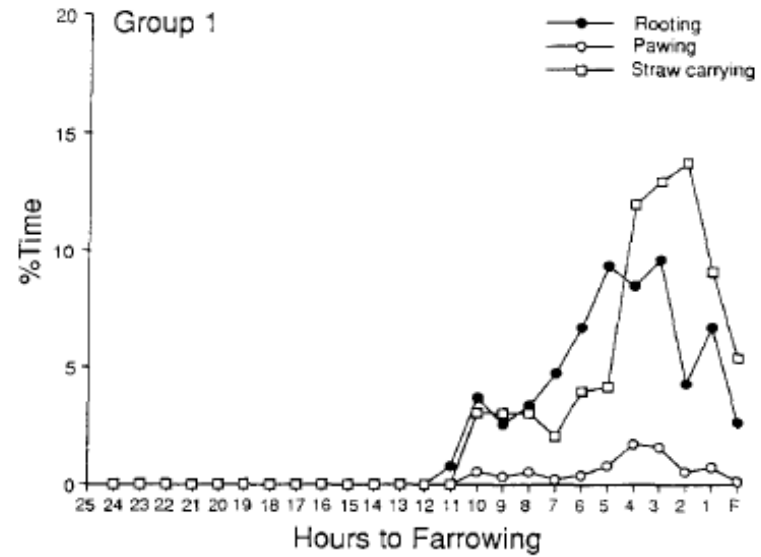
Behaviour – nest building

Builds nest (23 kg)



Nest already there (9 kg)

Arey et al 1991

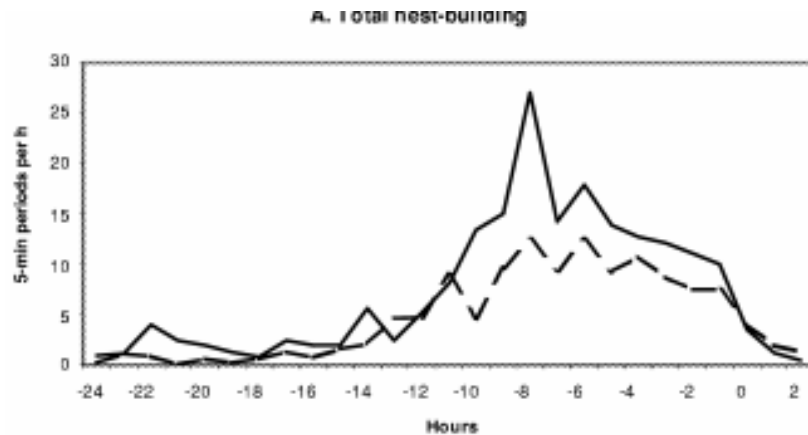


Funded by
the European Union

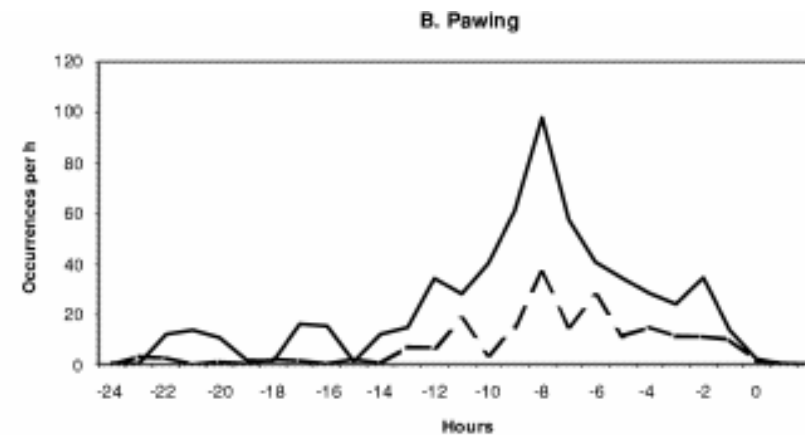


Behaviour - nest building

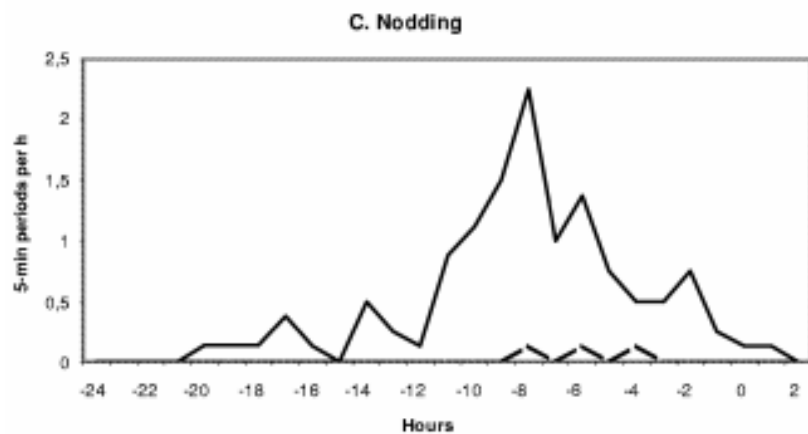
Total nest-building



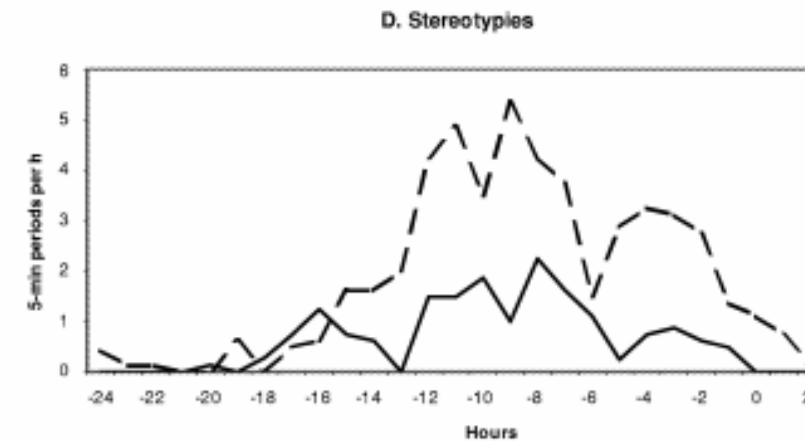
Pawing



Nodding



Stereotypies





Behaviour

- Fear
 - Typically of humans
 - Human approach test (voluntary approach test)
 - Strong effect on reproductive performance
 - Effect on piglet mortality





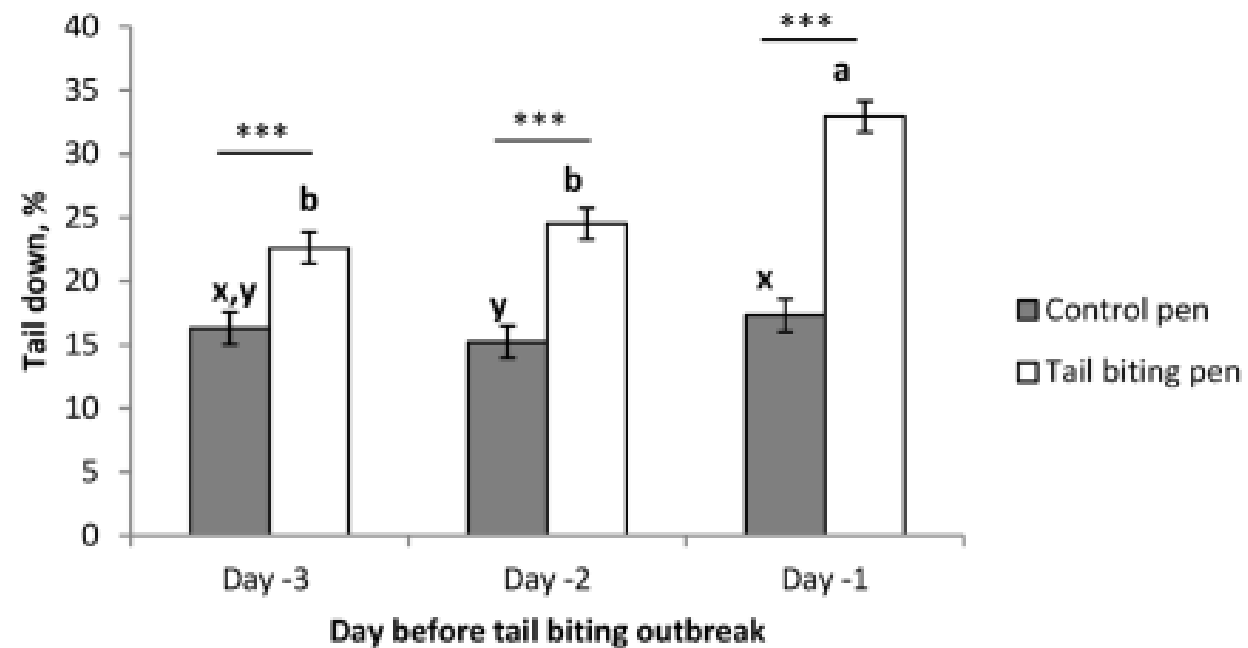
General indicators

- Tail and ear lesions – tail down
 - Lack of rooting material
 - Short feeding trough
 - General stressors (draught, feed change, disturbances)
 - Automatic recording being developed





General indicators – tail position





General indicators

- Stereotypies
 - Common in gestation section
 - Sometimes in farrowing stalls
 - Frothy saliva





General indicators

- Tear staining
 - Related to stress
 - Related to age
 - Attempts at automatic recording





General indicators

Measure	Animal group	Welfare relevance	Reproduc.	Practicality
Tail and ear biting	Sows, pigs, piglets	***	*	**
Stereotypic behav.	Sows	***	***	***
Lachrymal discharge	Pig	*	–	**
Runts	Piglets	***	***	***



Positive welfare

- Play
 - Intuitive
 - Social and non-social play
 - Hard to distinguish from fighting





Positive welfare

- Tail wagging
 - New indicator
 - Increase in positive situations





Positive welfare

Measure	Animal group	Welfare relevance	Reproduc.	Practicality
Play	Sows, pigs, piglets	***	**	**
Tail wagging	Sows, pigs, piglets	**	–	–



Overall welfare (?)

- Qualitative Behaviour Assessment (QBA)
 - Criticised for being subjective
 - Good IOR
 - Captures both positive and negative situations





What are the major welfare problems?

- Consider prevalence – duration – suffering:
 - Broken femur
 - Weaning
 - Tail biting
 - Crating
 - Feed restriction





Major welfare problems

Welfare issue	Suffering score for the population
Broken femur	0.022
Weaning 21 days	15
Tail biting	2.4
Crating	159
Feed restriction	344



Which indicators to choose? My 2 cents

- Mortality
- Roughage
- Tail biting
- QBA

