



EFSA's work on the use of animal welfare indicators for assessing pig welfare

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BTSF - Animal Welfare in pig production, 14-17 October, 2014, Herning, Denmark

Outline

- **What is EFSA? (5 minutes)**
- **EFSA's recent activities on pig welfare (15 minutes)**
 - 2012 EFSA Statement on the use of animal-based measures to assess the welfare of animals
EFSA Journal 2012; 10(6):2767.
 - 2012 Scientific Opinion on the use of animal-based measures to assess welfare in pigs
EFSA Journal 2012; 10(1):2512. 85 pp.
 - 2014 Scientific Opinion on a multifactorial approach on the use of animal and non animal-based measures to assess welfare of pigs
EFSA Journal 2014; 12(5): 3702 [101 pp.].



EFSA IS

- the EU reference body for risk assessment and risk communication
- part of a constellation of bodies that are responsible for food safety in Europe
- covers the entire food chain – from field to fork
- committed to ensuring food and feed safety



...WITH HEADQUARTERS IN PARMA, ITALY

- 2003: scientific work starts
- 2005: moved to Parma from Brussels
- Since 2003 more than 3,300 scientific outputs including 2,330 scientific opinions
- Budget 2014: EUR 79.6 million
- Over 450 staff, 60% engaged in the production of scientific advice

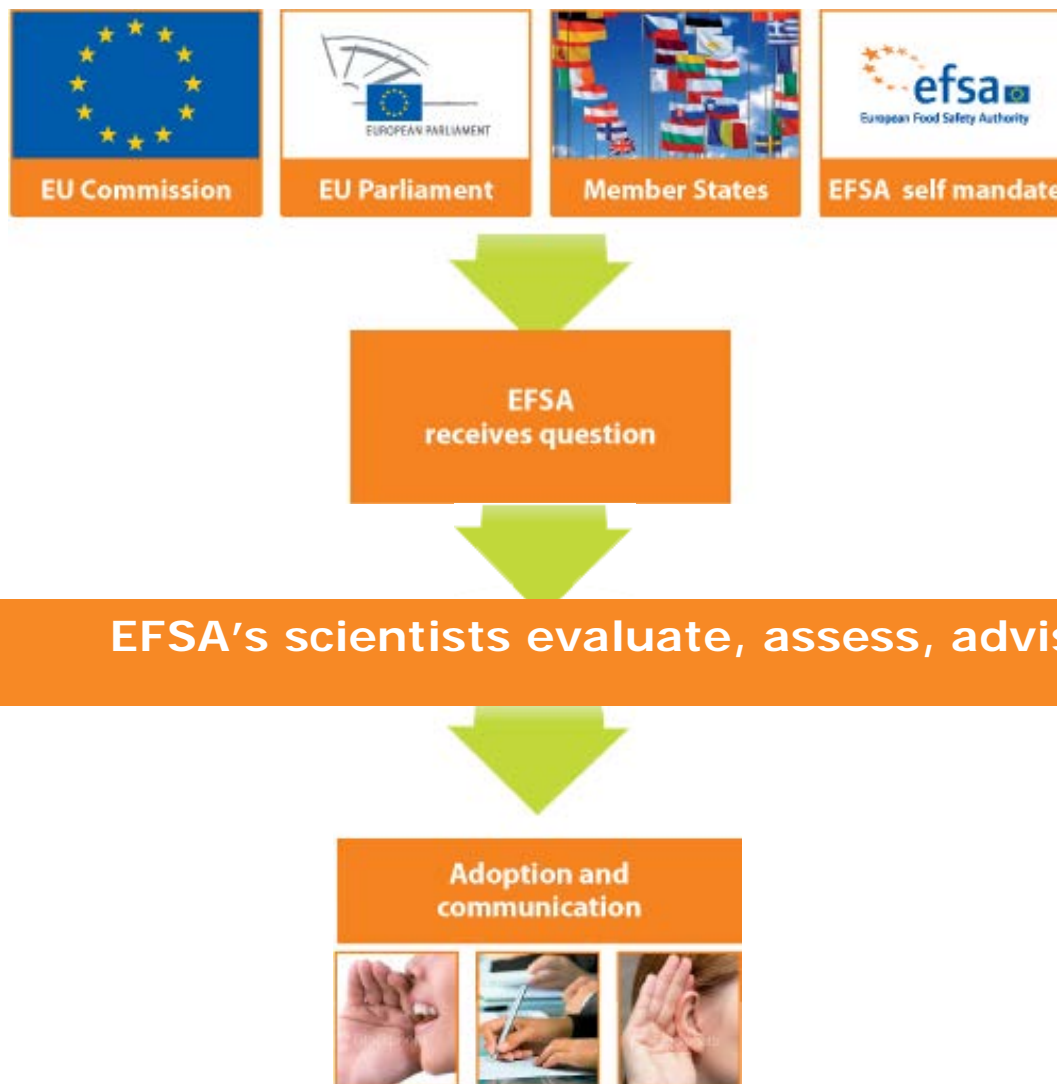


EFSA IS TASKED TO

- Provide independent scientific advice and support for EU law/policies on food and feed safety through risk assessment
- Provide independent, timely risk communication
- Promote scientific cooperation



... THROUGHOUT THE WORKFLOW



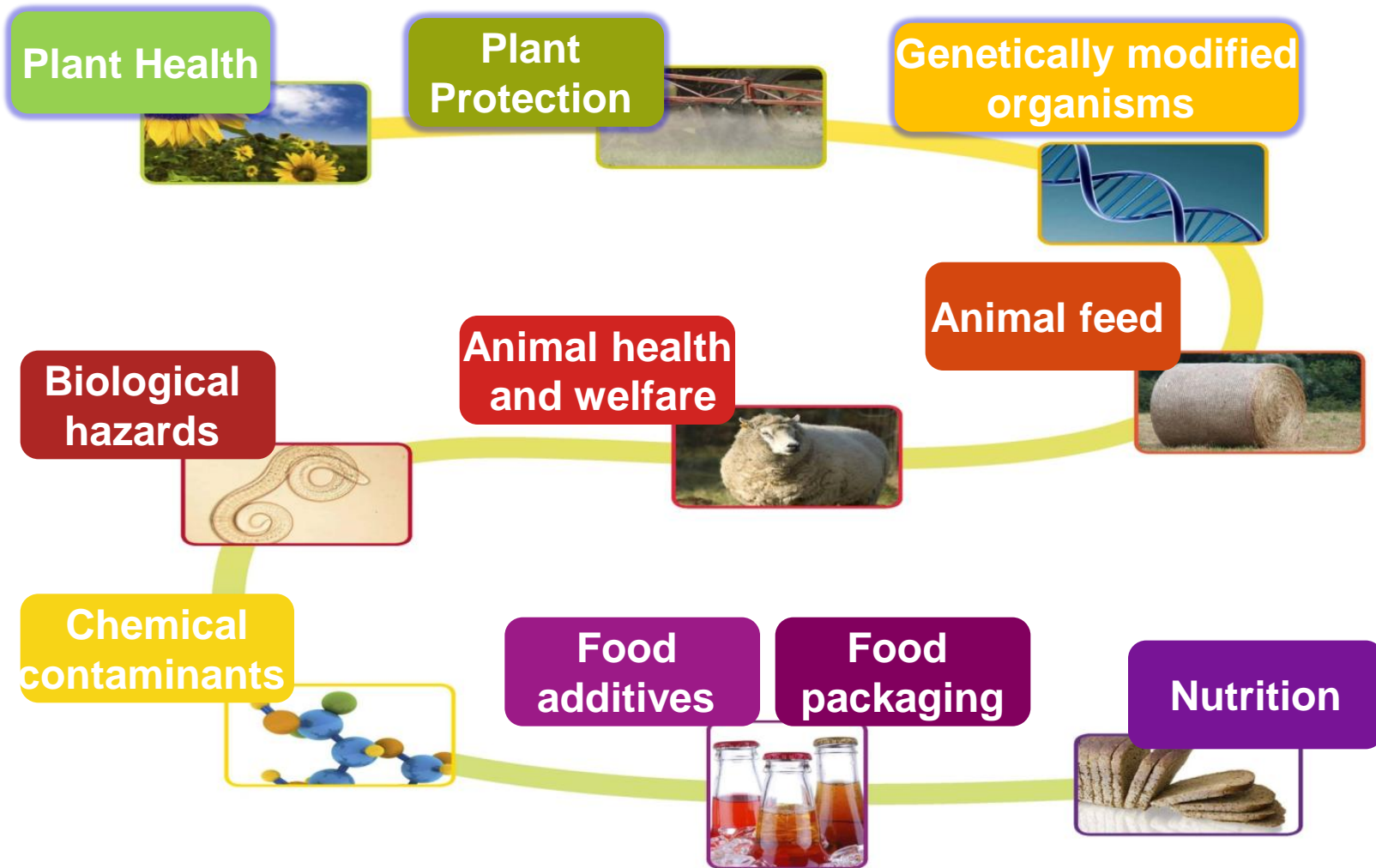
EXPERTS ARE CAREFULLY SELECTED

EFSA seeks high-calibre experts to serve on its Scientific Committee and Scientific Panels

- Open call to scientists from all EU Member States and beyond
- EFSA chooses candidates with proven excellence in one or more scientific fields within its remit
- Open, transparent selection procedure

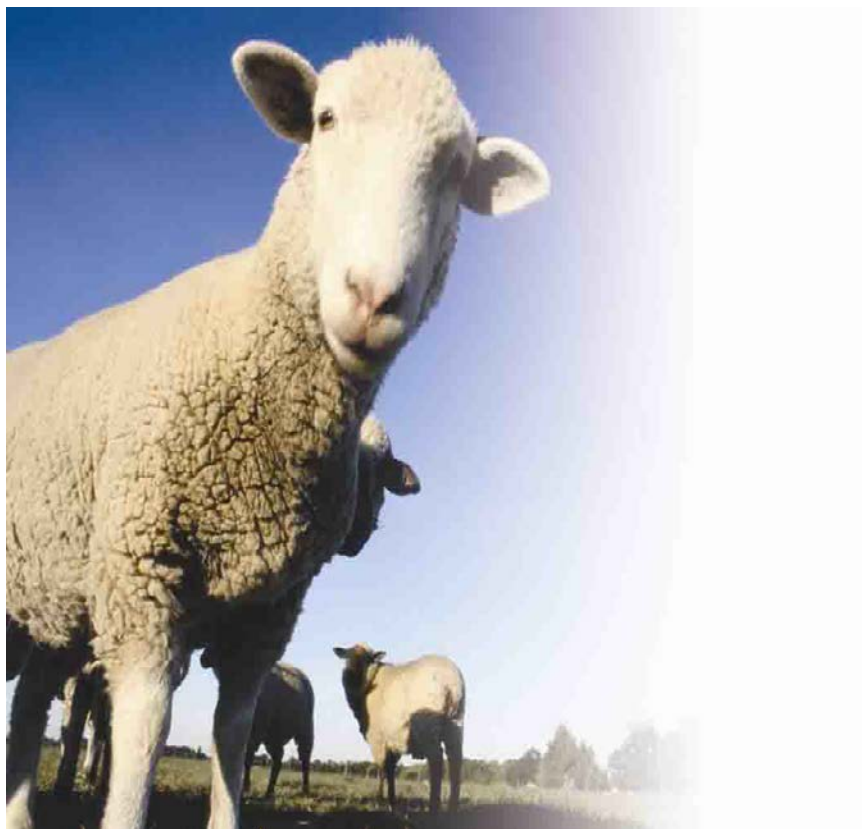


... WHOSE ROLE IS TO PROVIDE SCIENTIFIC ADVICE FROM FIELD TO FORK



AHAW TEAM OF EFSA

AHAW: ANIMAL HEALTH AND ANIMAL WELFARE



It provides scientific and technical advice on all aspects related to health and welfare of farming animals, including fish and bees.

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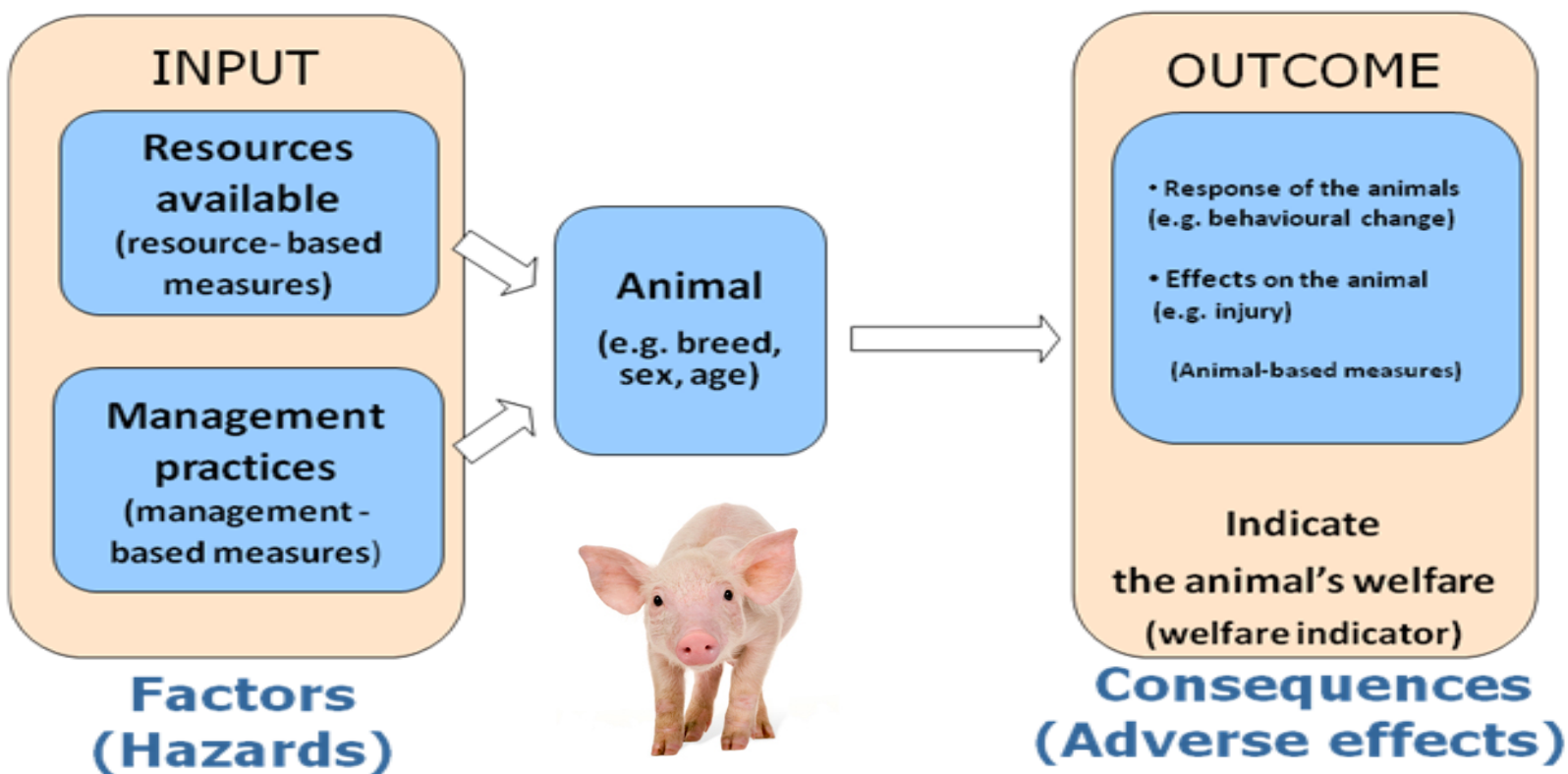


EFSA'S ACTIVITIES ON PIG WELFARE

EFSA's Activities Opinions	Year	Methodology
Welfare aspects of the <u>castration</u> of piglets	2004	Literature review
Welfare of weaners and rearing pigs: effects of different <u>space allowances and floor</u>	2005	Literature review
The risks associated with <u>tail biting</u> in pigs and possible means to reduce the need for tail docking	2007	Risk Assessment
Animal health and welfare aspects of different <u>housing and husbandry systems</u> for adult breeding boars, pregnant, farrowing sows and unweaned piglets	2007	Risk Assessment
Animal health and welfare in fattening pigs in relation to <u>housing and husbandry</u>	2007	Risk Assessment
<i>External reports</i> on Preparatory work for the future development of animal based measures for assessing the welfare of pigs (2011)	2011 a 2011 b	Literature review for updating all previous opinions
Statement on the use of animal-based measures to assess the welfare of animals	2012	Integration risk assessment – Animal based measures
Scientific Opinion on the use of animal-based measures to assess welfare in pigs	2012	
Scientific opinion on multifactorial approach on the use of animal and non animal-based measures to assess welfare of pigs	2014	

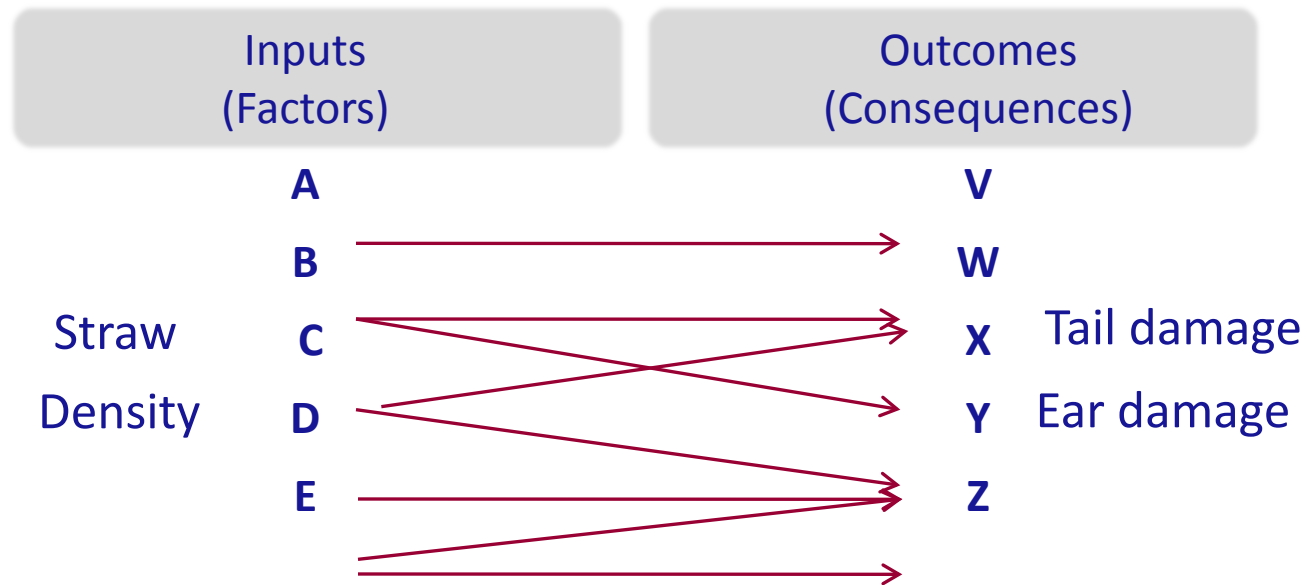
STATEMENT ON THE USE OF ANIMAL-BASED MEASURES TO ASSESS THE WELFARE OF ANIMALS - 2012

Use of animal based measures to assess welfare



STATEMENT ON THE USE OF ANIMAL-BASED MEASURES TO ASSESS THE WELFARE OF ANIMALS -2012

How to choose the optimal combination of animal-based measures (ABMs)?



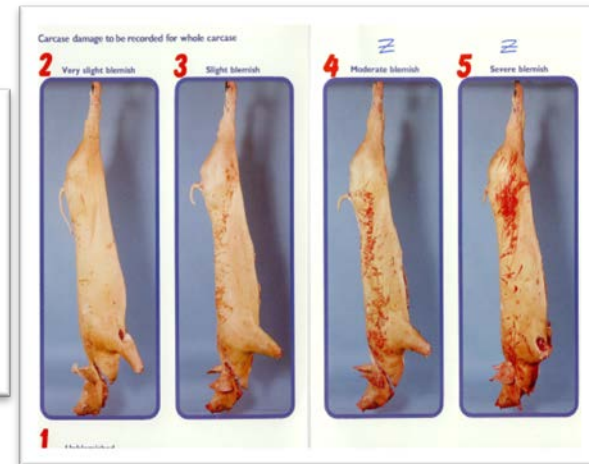
We might know the links but we don't know the strength or predictive value of them.
Toolbox of measures: which are the best ones?



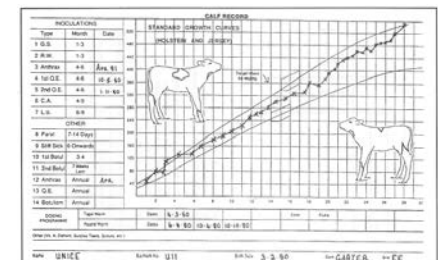
-Direct: inspections and measurements: directly taken, during on-farm welfare assessment or during ante-mortem inspections. For some measurements veterinary visit is needed (e.g. blood samples for Hg)



Score 2



- Indirect: records from production data (e.g. mortality rate, growth rate) or automatic recording (e.g. amount of feeding, amount of water)

[illegible][illegible]

STATEMENT ON THE USE OF ANIMAL-BASED MEASURES TO ASSESS THE WELFARE OF ANIMALS

Non animal-based measures (ABM):

- Resource-based measures (physical environment)
- Management-based measure (managerial practices)



Staff training record

Name: A staff member	Phone:
Position: Vetting Staff & Food Preparation	Start date:
Address: 12 Grimstone Street, Auckland	

Food Control Plan				
Type	Relevant	Employee signed	Supervisor signed	Date
Essential Training				
Health and sickness				
Food hygiene				
Personal hygiene				
Cleaning and sanitation				
Food safety				

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2012 –SCIENTIFIC OPINION ON THE USE OF ANIMAL-BASED MEASURES TO ASSESS WELFARE ON PIG

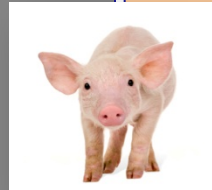
Terms of reference

- TOR1- To **identify how ABMs could be used to ensure the fulfilment of the EFSA recommendations** on welfare of pigs
- TOR2- How assessment protocols suggested by WQ cover the main hazards identified in EFSA scientific opinions and *vice versa* for an overall classification of welfare situation
- TOR3- Which relevant **animal welfare issues cannot be assessed using ABMs for pigs** and what kind of alternative solutions are available to improve the situation

2012 –SCIENTIFIC OPINION ON THE USE OF ANIMAL-BASED MEASURES TO ASSESS WELFARE ON PIG

Risk assessment vs welfare assessment

**EFSA
risk
assessment**



**Welfare
Quality
Project***

Risk assessment: identify risk factors for poor welfare focuses on hazards

Make recommendations for risk managers to reduce risk

Welfare assessment: focuses on comparison of welfare outcomes in different situations

It is a standardised methodology for the assessment of animal welfare on a single farm visit

* Full title: Integration of animal welfare in the food quality chain: from public concern to improved welfare and transparent quality

2012 –SCIENTIFIC OPINION ON THE USE OF ANIMAL-BASED MEASURES TO ASSESS WELFARE ON PIG

RECOMMENDATIONS ON MANIPULABLE MATERIALS

Scientific opinion on fattening pigs

- In order to provide for the need to root with the nose and manipulate destructible materials, each pig should have access to **manipulable, destructible material**, such as **straw** or **other fibrous material**.
- Since **indestructible objects**, such as chains or tyres, are not sufficient to provide for the manipulatory need of pigs, they may be used as a supplement to **destructible and rooting materials but not as a substitute for them**.

ABM:

Exploratory behaviour
 Persistent investigatory behaviour
 Tail-biting
 Ear-biting
 Flank-biting

NON ABM:

Nature of enrichment



2012 –SCIENTIFIC OPINION ON THE USE OF ANIMAL-BASED MEASURES TO ASSESS WELFARE ON PIG

Conclusions on tail biting

Scientific Opinion on tail biting and need for tail docking

Tail biting is considered an abnormal behaviour. The need to perform **exploration and foraging behaviour** is considered to be a major underlying motivation.

Tail biting has a **multi-factorial origin** and there is evidence that some causal factors have more weight, such as absence of straw, the presence of slatted floors and a barren environment.



Courtesy L. Keeling

2012 –SCIENTIFIC OPINION ON THE USE OF ANIMAL-BASED MEASURES TO ASSESS WELFARE ON PIG

Scientific opinion on tail biting

To minimise the risk of tail-biting, it is recommended to address the following **major risk factors**: (i) **provision of straw, preferably as bedding**, and (ii) **proportion of slatted floors** in housing systems for fattening pigs. Due to the severe adverse effects for pigs of tail biting inducing poor welfare, when tail biting incidence increases in a farm, **other factors** which have also effect on the likelihood of tail biting (e.g. **Air speed, health status, high temperatures**) should be considered.

ABM:

Tail lesions on-farm and at slaughter

Tail-biting

Exploratory behaviour

Disease signs on-farm

Disease signs at slaughter

Acute phase protein

Body condition score

Panting

Lying location, Lying posture

Manure on the body score

Potentially all ABMs indicating adequacy of housing and management

NON ABM:

Type of floor (% slats)

Presence of straw

Quantity of straw

Space

Temperature

Airspeed

[there are other resource-based measures]

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 - **2014 Scientific Opinion on a multifactorial approach on the use of animal and non animal-based measures to assess welfare of pigs**
EFSA Journal 2014; 12(5):3702 [101 pp.].



Scientific Opinion on a multifactorial approach on the use of animal and non animal-based measures to assess welfare of pigs - 2014

Background

- The Commission is planning to develop **guidelines to facilitate the proper implementation** of the requirements of Council Directive 2008/120/EC.
- Guidance will likely be structured by topic and the first two topics have been decided: **provision of manipulable material and avoidance of tail docking**. The scope may later be extended.

Terms of Reference

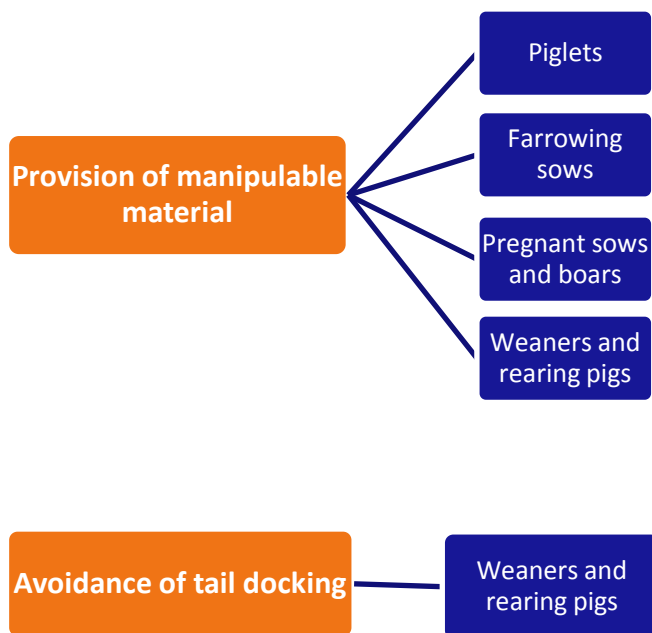
- TOR1. **Identify the multiple interactions** between risk factors, welfare consequences and animal-based and non-animal based measures
- TOR 2. **Identify the strength and predictive** capacity of the above identified interactions
- TOR 3. **Propose a model/toolbox** to evaluate how likely certain welfare consequences may happen given specific risk factors and which animal- and/or non-animal based measures would better fit for the assessment of those consequences.

Adopted May 2014

Scientific Opinion on a multifactorial approach on the use of animal and non animal-based measures to assess welfare of pigs - 2014

TERM OF REFERENCE 1

TOR1. Identify the multiple interactions between risk factors, welfare consequences and animal-based and non-animal based measures



RISK FACTORS	WELFARE CONSEQUENCES	ANIMAL-BASED INDICATOR
A	Frustration of ...	1
B		2
C		3
D		4

Scientific Opinion on a multifactorial approach on the use of animal and non animal-based measures to assess welfare of pigs - 2014

TERM OF REFERENCE 1

TOR1. Identify the multiple interactions between risk factors, welfare consequences and animal-based and non-animal based measures

RISK FACTORS (resources, environmental and management factors)	WELFARE CONSEQUENCES	ANIMAL-BASED INDICATORS (direct and indirect)
Total lack of manipulable material (actual presence) → a, g → b, c, h	a. Frustration of exploratory motivation → 1, 2, 5, 6, 8, 9, 10, 12 → 11	1. Increased frequency of oral manipulation of other pigs
Unavailability of manipulable material during certain time periods → a, e, g → b, c, h	b. Frustration of foraging motivation → 8, 9 → 1, 5, 6, 10	2. Changes in play behaviour with manipulable material
Inaccessibility of manipulable material → a, d, e, g → b, c, h	c. Frustration of motivation to manipulate nesting material before lying down → 6 → 1, 3, 5, 8, 9, 10	3. Soiling of pen, soiling of manipulable material
Low quantity of manipulable material (amount) → a, e, g → b, h	d. Frustration due to material being out of reach → 1, 2, 5, 6, 8, 9, 10	4. Increase of disease
Low quality of manipulable material → a, f, g. → b, c	e. Competition for restricted amount of material → 5, 6, 8, 9, 10 → 12	5. Decreased manipulation of manipulable material
Inappropriate location of manipulable material in relation to the intended function of the material → e, f, g, h.	f. Health and thermoregulation problems arisen from poor hygiene → 3, 4, 13 → 7	6. Increased manipulation of pen furniture

Scientific Opinion on a multifactorial approach on the use of animal and non animal-based measures to assess welfare of pigs - 2014

TERM OF REFERENCE 2

TOR 2. Identify the strength and predictive capacity of the above identified interactions

An attempt was made to statistically quantify the relationships described in ToR1 between risk factors, animal-based measures and welfare consequences by carrying out a statistical analysis of information of available datasets:

- Welfare Quality[®] studies: 6 datasets received from six countries. Data collected using a standard protocol making it possible their combination. *Data from **242 intensive farms** , analysed at farm and pen level.*
- Only one dataset (Finnish): *data from **1,574 farms**, collected by health visits, investigating 8 manipulable materials in undocked pigs: straw, hay, peat, saw dust, paper, woodchips, wood, toy.*



Scientific Opinion on a multifactorial approach on the use of animal and non animal-based measures to assess welfare of pigs - 2014

TOR 2. Identify the strength and predictive capacity of the above identified interactions

MAIN OUTCOMES

From the analyses of the Finnish dataset :

- **The use of straw was associated with reduced tail-biting prevalence relative to the other types of manipulable material** (including objects) present on Finnish farms.
- No other manipulable material gave consistent reduction in tail-biting across both weaner and rearing pigs compared to the population average.

From the analyses of combined the Welfare Quality® studies:

- A number of animal and resource-based factors **are suggested to be important risk factors** for tail-biting, but **a high degree of uncertainty in the model precludes strong conclusions**. The dataset used was not designed to evaluate risk factors for tail-biting and therefore, it had limitations in fitness for this analysis.
- indication of **the possibility for undocked pigs to be housed and managed in a way which does not imply an increased risk for tail-biting**. However, this requires further investigation in more comprehensive datasets where the overall farm prevalence of bitten tails, including animals in hospital pens and euthanized/culled animals, is recorded.

Scientific Opinion on a multifactorial approach on the use of animal and non animal-based measures to assess welfare of pigs - 2014

TERM OF REFERENCE 3

TOR 3. Propose a model to evaluate how likely certain welfare consequences may happen given specific risk factors and which animal- and/or non-animal based measures would better fit for the assessment of those consequence

Proposed tool-box for the assessment of adequacy of manipulable material

1 Resource-based measures (properties of the manipulable material provided)

- **1A- Material characteristics:** what is presented:
 - Safe
 - Deformable and moveable by pig manipulation
 - Multi- functional (rooting chewing, ingesting.etc)
 - Feed-related properties (odorous ,palatable flavour and nutritious)
- **1B - Managerial characteristics:** how it is presented:
 - Novel/renewed (regularly replaced or replenished)
 - Accessible (available for oral manipulation to all pigs at all times)
 - Hygienic (not soiled with excreta)

2 Animal-based measures (combination of physical and behavioural measures)

- **2A - Absence of bitten tails**
- **2B - Absence of skin lesions**
- **2C - Appropriate exploratory behaviour** (the ratio of exploration directed to manipulable material in comparison to that directed to pen fittings and other pigs or vacuum oral behaviour). For farrowing sows the ratio should be between nest building behaviour and redirected behaviour.

Scientific Opinion on a multifactorial approach on the use of animal and non animal-based measures to assess welfare of pigs - 2014

TERM OF REFERENCE 3

TOR 3. Propose a model to evaluate how likely certain welfare consequences may happen given specific risk factors and which animal-and/or non-animal based measures would better fit for the assessment of those consequence

Proposed tool-box for the assessment of the risk of tail biting

Hazard/Risk Factor	Resource /management-based indicators of hazard	Animal-based indicators of hazard
1. Presence of biting		Increased tail lesions and tail-biting behaviour; Lowered tail posture; Increased restlessness
2. Manipulable materials	Absence of manipulable material with properties related to functionality: 1 Material characteristics 2 Managerial characteristics	Presence of bitten tails, Presence of skin lesions Inappropriate exploratory behaviour
3. Health	Poor biosecurity programme; Lack of specific pathogen free status Inadequate vaccination programme.	Increase of the following indicators: Panting, shivering; Lying behaviour ; Coughing, sneezing; red eyes; Poor body condition; Diarrhoea; Variation in pig size within group
4. Genotype	High genetic merit for lean tissue growth rate and low fat deposition	High carcass leanness
5. Competition	High number of animals per m ² ; High number of animals per feeder; Poor mixing management	Increase of the following indicators: Skin lesions; Aggression; Restlessness, Poor body condition
6. Environment	Extreme or variable air temperature; High air speed; Intense light level; High level of noxious gases (CO ₂ , NH ₃)	Increase of the following indicators: Panting, shivering, Poor body condition, poor coat condition; Restlessness; Red eyes; Modified lying behaviour showing thermal discomfort;
7. Diet	Diet composition: Lack of sodium Lack of amino acids Lack of energy	Increase of the following indicators: Poor body condition, diarrhoea; Poor coat condition, Restlessness, Foraging behaviour; Gastric ulcers; Variation in pig size within group

Further detailed information consult the published Opinion available on EFSA Website:

www.efsa.europa.eu



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Fish Welfare

Animal Welfare

Animal welfare is an important part of EFSA's remit. The safety of the food chain is indirectly affected by the welfare of animals, particularly those farmed for food production, due to the close links between animal welfare, animal health and food-borne diseases. Stress factors and poor welfare can lead to increased susceptibility to disease among animals. This can pose risks to consumers, for example through common food-borne infections like Salmonella, Campylobacter and E.Coli.

The welfare of food producing animals depends largely on how they are managed by humans. A range of factors can impact on their welfare including housing and bedding, space and crowding, transport conditions, stunning and slaughter methods, castration of males and tail docking.

Animal welfare: animal-based indicators

Animal welfare
Animal-based indicators

See also

- Panel on Animal Health and Welfare (AHAW)
- Panel on Biological Hazards (BIOHAZ)
- Animal Health homepage
- Cloning homepage
- Feed homepage