

# Animal welfare index in sustainability assessments

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**'SUSTAINABLE LIVESTOCK SYSTEMS'**  
– what does this mean?



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Need tools for sustainability assessments  
Animal welfare is one of many sustainability aspects

UNEP (2020) Guidelines for social LCA

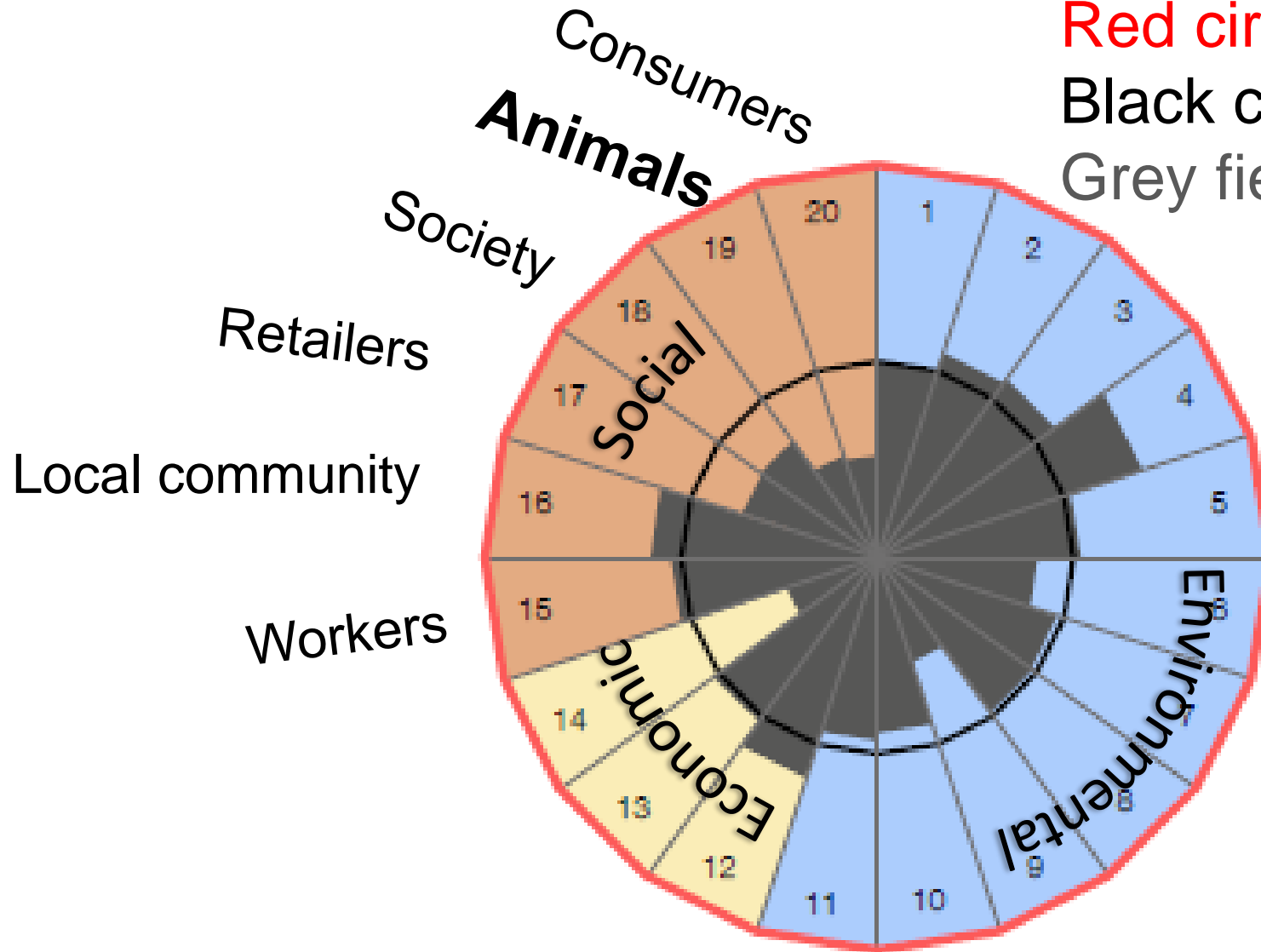
“Ethical treatment of animals”

Stakeholder: Society

*UNEP: UN Environmental Programme*



Red circle = max negative  
 Black circle = conv. prod.  
 Grey fields = organic prod.



Sustainability assessment of Swedish pork

*Zira et al, 2021*

Animal welfare index used in broad sustainability assessments of

- total Swedish food production
- total Swedish food consumption, including imported food
- diets of European consumer groups

Indicators of animal welfare level of the production system

- 'Stocking density'
- Disease ratio
- Mortality on farm
- Slaughter process duration

Indicators expressed from 0 to 1, and summarised

Animal welfare level =

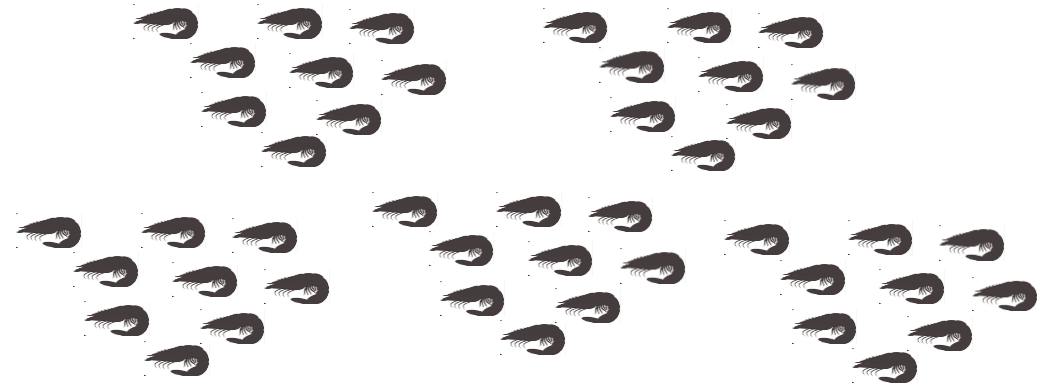
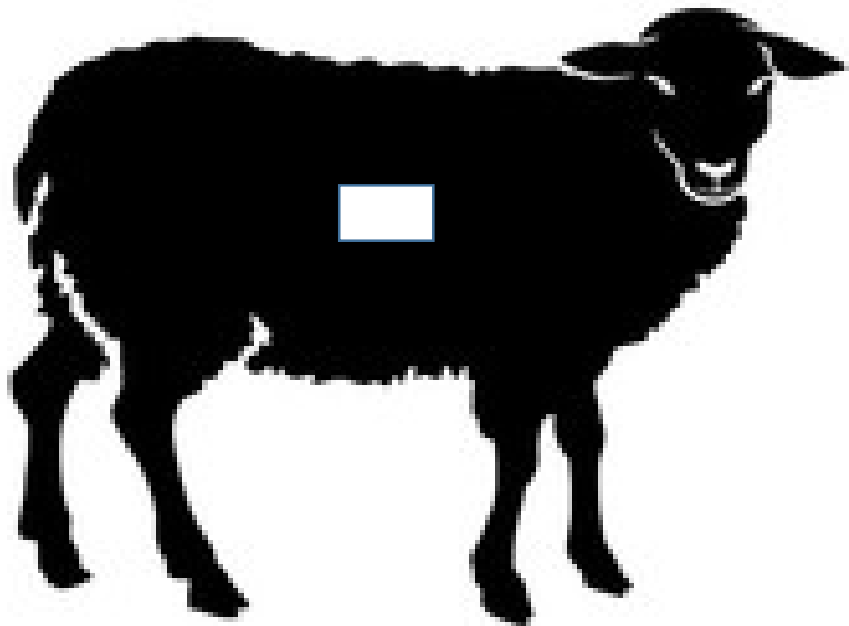
$2 \times (\text{Stocking density} + \text{Disease} + \text{Mortality}) + \text{Slaughter duration}$

Higher level is worse



Number of animals involved in our consumption

How many 'animal lives' are needed for 1 kg food?



Animal welfare index value, per kg =  
(Animal welfare level of production system x (0.25 x Number of animals)  
x Animals' ability to perceive negative effects of being used by humans)  
x 100



Give most points to highest ability to perceive negative effects of being used by humans

10,000 points on all species means no difference

0 points means the species has no ability

*Distribute  
110,000 p*

**(Group of) species**

**Ability**

Octopus, squid

Meal worm

Ruminants (including game)

Poultry and game birds

Lobster, crab, languster, shrimp

Pig and wild boar

Cricket and honey bee

Mussels and oysters

Horse and donkey

Rabbit and hare

Salmon and other bone fish

Give most points to highest ability to perceive negative effects of being used by humans

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<b>(Group of) species</b>	<b>Ability</b>	<u>Relative</u>
Octopus, squid	8,113	0.073
Meal worm	878	0.008
Ruminants (including game)	19,613	0.178
Poultry and game birds	13,097	0.119
Lobster, crab, languster, shrimp	2,972	0.027
Pig and wild boar	21,130	0.192
Cricket and honey bee	1,976	0.018
Mussels and oysters	1,104	0.010
Horse and donkey	19,611	0.178
Rabbit and hare	14,916	0.136
Salmon and other bone fish	6,592	0.060

# Example Diet 1

'European conventional' production systems

Lower index value  
is better

Food	Gram per week	Welfare level of prod. system	No. animals involved per kg	Animals' ability to perceive	Welfare index value per kg	Welfare index value for diet
Beef	300	1.50	0.003	0.178	0.02	0.01
Milk	350	1.52	0.001	0.178	0.01	0.002
Chicken	200	1.88	0.750	0.119	4.19	0.84
Egg	150	2.16	0.053	0.119	0.34	0.05
Pork	400	2.36	0.018	0.192	0.20	0.08
Salmon	100	1.20	0.400	0.060	0.72	0.07

## Importance of consumption level and species

Food	Diet 1 g / wk	Welfare index value for diet 1	Diet 2 g / wk	Welfare index value for diet 2	Diet 3 g/ wk	Welfare index value for diet 3
Beef	300	0.01	300	0.01	<b>350</b>	0.01
Chicken	<b>200</b>	0.84	<b>100</b>	0.42	<b>100</b>	0.42
Pork	400	0.08	400	0.08	<b>450</b>	0.09

## Importance of welfare level of the production system

Food	g / wk	Welfare level of prod. system	No. animals involved per kg	Ability to perceive	Welfare index value for diet
Pork	400	2.36	0.018	0.192	0.08
Pork worst possible	400	5.00	0.018	0.192	0.17
Pork best possible	400	0.01	0.018	0.192	0.001

Lower index value  
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Do you have comments?

Do you want to fill in the questionnaire?

Welcome to contact me!

*Lotta.Rydhmer@slu.se*

I thank

- Colleagues responding to the questionnaire
- Mistra FoodFutures, a Swedish Mistra project
- Plan'Eat, an EU Horizon project
- **You, for listening!**

(Group of) species	Ability
Octopus, squid	
Meal worm	
Ruminants (including game)	
Poultry and game birds	
Lobster, crab, languster, shrimp	
Pig and wild boar	
Cricket and honey bee	
Mussels and oysters	
Horse and donkey	
Rabbit and hare	
Salmon and other bone fish	



# Welfare level of production systems 'European conventional' average

Extra slide

Species	'Stocking density'	Disease ratio	Mortality on farm	Slaughter process duration	Welfare level of production system
Beef cattle	0.20	0.10	0.05	0.8	1.50
Dairy cow	0.19	0.12	0.05	0.8	1.52
Chicken	0.63	0.03	0.03	0.5	1.88
-"- parents	0.64	0.15	0.08	0.5	2.24
Laying hen	0.55	0.25	0.03	0.5	2.16
Pig	0.63	0.10	0.20	0.5	2.36
Salmon	0.10	0.10	0.15	0.5	1.20

Lower level is better


Extra slide

Animal welfare definition:

“The physical and mental state of an animal in relation to the conditions in which it lives and dies”

From: World organisation for animal health (OIE)

# Framework for integrating animal welfare into life cycle sustainability assessment

Laura Scherer<sup>1</sup>  · Brian Tomasik<sup>2</sup> · Oscar Rueda<sup>3</sup> · Stephan Pfister<sup>4</sup>

Extra slide

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Changing dietary patterns is necessary to improve the sustainability of Western diets from a One Health perspective

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