HOUSING SYSTEMS AND MANAGEMENT PRACTICES FOR KEEPING MINK.
WELFARE CHALLENGES AND OPPORTUNITIES

AARHUS
UNIVERSITY
DEPARTMENT OF ANIMAL AND VETERINARY SCIENCES

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STEEN HENRIK MØLLER
SENIOR RESEARCHER

EFFECTS OF HOUSING AND MANAGEMENT ON FUR ANIMAL WELFARE

How can we know?

What do we know?

Welfare effects of housing and management depends on the biology and needs of the animal species we are looking at!

Mink, Silver fox, Blue fox, Raccoon dog, Chinchilla, Castor Rex, Nutria, etc.

Frequent questions:

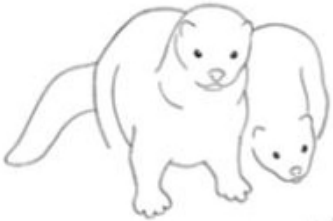
- Are they domesticated?
- What are their biological/behavioural/social needs?
- To what extent are such needs fulfilled in the production?

HOW CAN WE KNOW ABOUT ANIMAL WELFARE?

Resource based measures

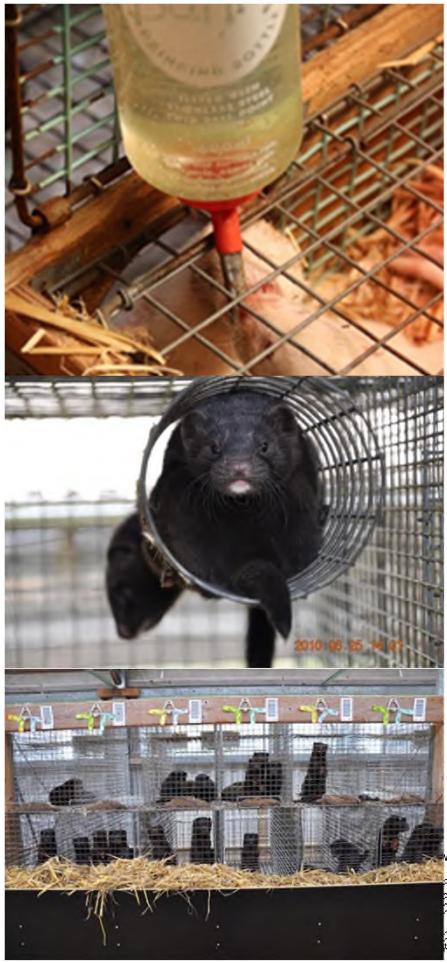
System (potential for good welfare/ risk of welfare problems)

Management

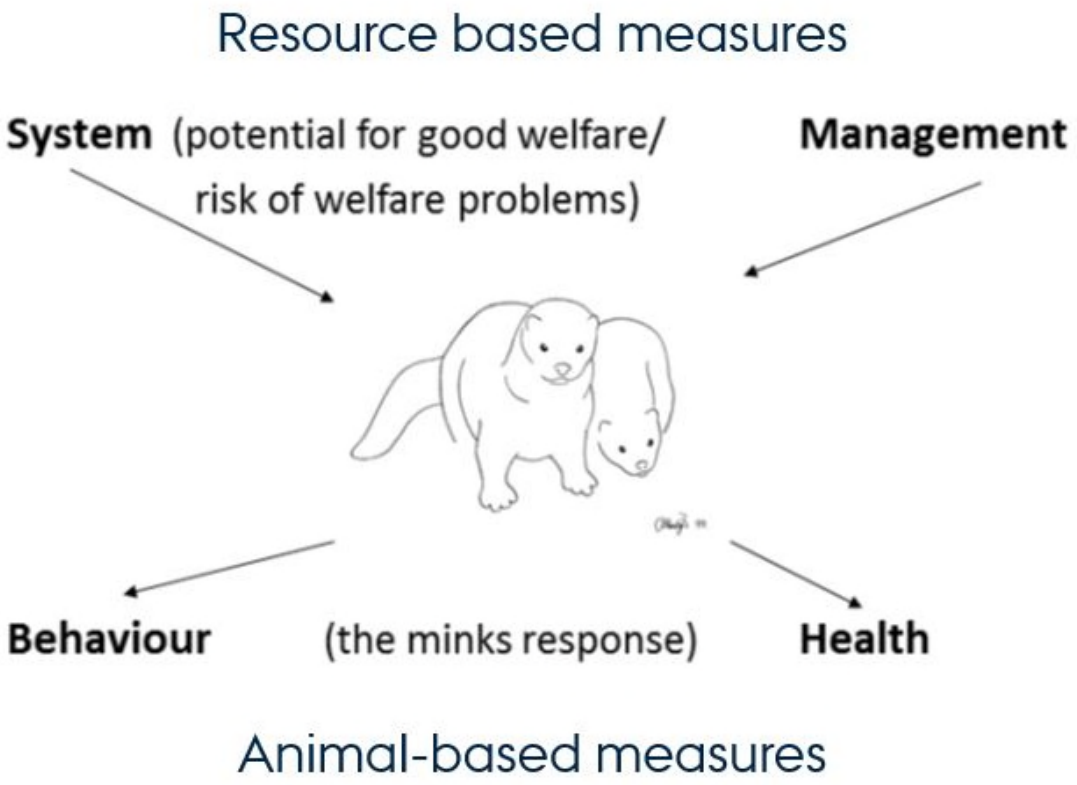


Behaviour (the minks response) **Health**

Animal-based measures



40 YEARS OF FUR ANIMAL WELFARE SCIENCE



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WHAT DO WE KNOW ABOUT ON-FARM FUR ANIMAL WELFARE?

From 40 years of fur animal welfare science, we know about

- The biology and needs
- Current systems and management risks
- Behaviour and health outcomes

- This has been used to develop welfare assessment protocols for
  - Mink
  - Foxes
  - Finnraccoon

THE WELFUR PROJECT

- Initiated by EFBA in 2009
- Researchers from 7 universities in 6 European countries
- On-farm welfare assessment protocols for mink and foxes
  - Later also Finnraccon
- Based on Welfare Quality®
- Supervised by a Welfare Quality® review committee

Principle	Criteria
1 Good feeding	1 Absence of prolonged hunger
	2 Absence of prolonged thirst
2 Good housing	3 Comfort around nesting
	4 Thermal comfort
	5 Ease of movement
3 Good health	6 Absence of injuries
	7 Absence of disease
	8 Absence of pain induced by management procedures
4 Appropriate behaviour	9 Expression of social behaviours
	10 Expression of other behaviours
	11 Good human-animal relationship
	12 Positive emotional state

WELFUR IMPLEMENTATION

- Fur production is strictly seasonal, including the full life span of the animals
- WelFur has to be assessed in all three seasons
- Winter
- Nursing
- Growth
- Each assessment period is 6-8 weeks long, at the end of each season

Annual cycle of mink production

Principle	Criteria	Measurements
1 Good feeding	1 Absence of prolonged hunger	**Are mink too thin?**
	2 Absence of prolonged thirst	Do all mink have access to drinking water? Do drinking nipples work and are they clean?
2 Good housing	3 Comfort around nesting	Do all mink have access to a nest box? Are nest boxes dry, clean, no sharp edges and no fleas?
	4 Thermal comfort	Are nest boxes protected from wind, direct sun and heat? Are nest boxes insolating, exposed to draught, is bedding material available?
	5 Ease of movement	Do all mink have sufficient available space for movement?
3 Good health	6 Absence of injuries	**Do mink have skin lesions or injuries to the body?**
	7 Absence of disease	**How many mink died in the period?** **Are there any sick mink?** **Mink with diarrhoea** **Mink with impaired movement?**
	8 Absence of pain induced by management procedures	Efficient methods of killing mink at pelting? Efficient methods of killing mink in case of disease or injury?
4 Appropriate behaviour	9 Expression of social behaviours	Are mink housed individually, in pairs or groups in the growth season? What are the age and procedures at weaning?
	10 Expression of other behaviours	**Do mink display stereotypic behaviour?** Are mink given cage enrichment? **Do they display fur chewing?**
	11 Good human-animal relationship	Frequency and duration of handling?
	12 Positive emotional state	**Are the mink fearful or curious?**

BACK TO QUESTIONS: ARE FUR ANIMALS DOMESTICATED?

Fur animals have been farmed for 150 years -100 generations of domestication (mink)

- Fur animals are part of the 'second wave' of domestication *(Per Jensen, 2017)*
- Have typical changes in brain size and structure (mink – Kruska, 1996; Kruska & Schreiber, 1999)
- Mink and foxes can be efficiently selected for temperament (Malmkvist et al., 2003; Trapezov et al., 2004)
  - Most mink are explorative towards humans, in standard approach-avoidance tests used in WelFur

WelFur test of 260,382 adult and 446,334 juvenile mink in Europe in 2017-2019 (Henriksen et al, 2021)

A: 63.1%, J: 51.0%

A: 11.2%, J: 15.6%

A: 9.5%, J: 0.8%

SOCIAL NEEDS OF MINK

- Mink are social as kits
- Juveniles gradually become solitary and territorial as adults
  - Autumnal equinox is the signal to find a territory
- Thus, to follow the social needs of mink:
  - Adults kept alone, except for mating
  - Nursing females and kits together, for the full length of lactation
  - Juveniles kept in male-female pairs during growth (territorial overlap)
    - Group housing is allowed in Europe, although it increases aggression

CAGE SIZE FOR MINK

- In nature mink have a territory of 1 - 5 km (Dunstone, 1993)
  - Depending on availability of feed/resources (Dunstone, 1993)
- The content of the cage seems to be more important than the size
  - A nest box with bedding material for resting is important
  - Enrichments are important
  - Solid floor has not been investigated
- The cage becomes the territory of the mink
  - Even during the nursing period, it is difficult to observe negative effects of neighbours

ENRICHMENTS = RESOURCES WITH BENEFICIAL EFFECTS

- Positive use or reduction of negative indicators by enrichments have been documented, e.g.
  - Another juvenile of the opposite sex during growth
  - Bedding material, bunks, things to manipulate, running wheel, water, feed with more structure, etc.
  - WelFur mean = 1.8, 2.3, 1.5 enrichments in use per cage per season
    - More enrichments were seen in countries with legal requirements of enrichments documented to address different motivations
  - More types and shifting enrichments should be tested
  - Limited studies of outdoor access

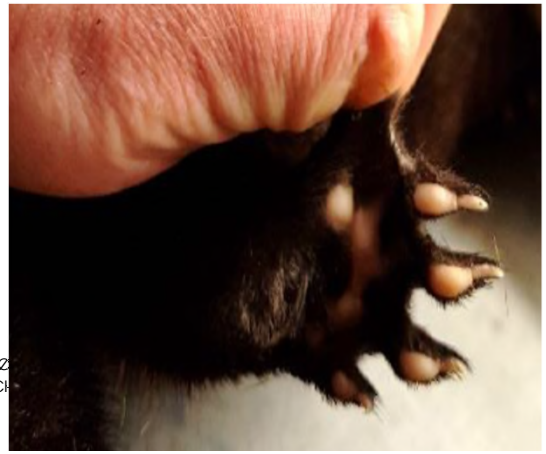
SWIMMING WATER FOR MINK

- Mink value swimming water similarly to a running wheel (Hansen and Jensen, 2006)
  - In nature, water is an additional feed resource (Dunstone, 1993)
  - No clear indication of a need in mink (SLU, 2018)
  - More research using validated methods would be good
  - Mink feet are almost skinless between the toes and more typical of animals that move quickly on land (Dunstone, 1993)

Otter (Jens Muff Hansen/Naturplan)

Mink (AU)

Mink (AU)



ARE THEIR NEEDS FULFILLED?

If important needs are compromised, consequences would be expected, such as

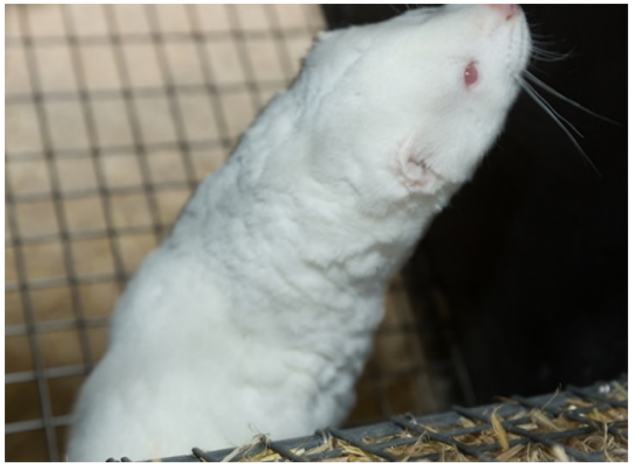
- Stress leading to
  - Fear of humans
  - Impaired reproduction
- Abnormal behaviours such as
  - Fur chewing
  - Stereotypy
- Aggression leading to
  - Wounds and injuries
  - Mortality

ABNORMAL BEHAVIOURS

Observed in WelFur Mink on 2104 farms from 23 European countries in three seasons

- Stereotypy, all types
- Fur chewing in 3 grades, from:

Moderate to Severe to Extensive



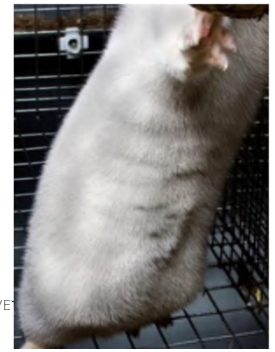
IRIK MØLLER
SEARCHER

AARHUS
UNIVERSITY
DEPARTMENT OF ANIMAL AND VETERINARY SCIENCES

STEREOTYPY AND FUR CHEWING ON WELFUR MINK FARMS IN EUROPE 2017-2019 (HENRIKSEN ET AL, 2021)

Season:	Winter	Nursing	Autumn
Stereotypy	5.8%	1.0%	0.9%
Fur chewing	11.5%	-	4.0%
Mink obs.	261,385	278,854	447.794

Stereotypy develops mainly in young females selected as breeders, when slimmed from pelting body condition to breeding body condition.

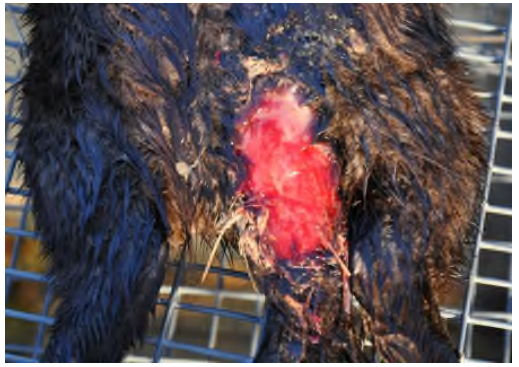
From BCS  or  to BCS  or 

MORTALITY AND WOUNDS

Observed in WelFur Mink on 2104 farms from 23 European countries in three seasons

- Mortality
- Wounds and injuries in 3 grades, from:

Minor < 10 mm to Serious < 30 mm to Severe > 30 mm



Severe injuries in pairwise housed juveniles, on average add up to 0.1%

Severe injuries in group housed juveniles after the equinox, on average add up to 2.0%

INJURIES AND MORTALITY ON WELFUR MINK FARMS IN EUROPE 2017-2019 (HENRIKSEN ET AL, 2021)

Season:	Winter	Nursing Adults/Kits	Autumn
All injuries	2.1%	0.7%/0.5%	1.7%
Mortality	1.4%	1.3%/1.1%	9.1%
Mink obs.	261,349	281,013/ 1,215,368	447,991

Neonatal kit mortality cannot be observed reliably and is not included

CONCLUSION FROM WELFUR MINK

WelFur categories were: Unacceptable, Acceptable, Good and Best current practice

- Most mink farms in Europe (71.7%) were labelled 'Good current practice'

WelFur results for the four principles are given in scores from 0 (worst) to 100 (best)

Ranked results:

1. 'Good housing' scored (76.2)
2. 'Good health' scored (71.4)
3. 'Good feeding' scored (69.7)
4. 'Appropriate behaviour' scored (55.0)

CONCLUSION FROM WELFUR MINK

We know the assessed welfare status

We know where the main challenges are:

- Weaning procedures
- Abnormal behaviour
- Group housing
- Temperament
- Too thin animals late in the winter

We know about good solutions:

- Low scoring criteria had medium to high variation between farms
  - Indicating that low scoring farms could learn from high scoring farms

LACK OF KNOWLEDGE ON MINK

- WelFur is built on WQ® and the existing production systems
  - There is a lack of scientific studies comparing this to alternative systems
    - E.g. solid floor, outdoor areas, cage free, etc.
- There is a lack of standardised tests of more types of enrichments
  - Shifting of enrichments for novelty
- Research on the value of swimming water using validated methods
  - For operant conditioning and stress measurements
- Aggregation of WQ® scores is built to limit compensation of low scores
  - And thus difficult to understand
  - Is the limitation of compensation good enough?
  - Should thresholds be added?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