

Refining Refinement

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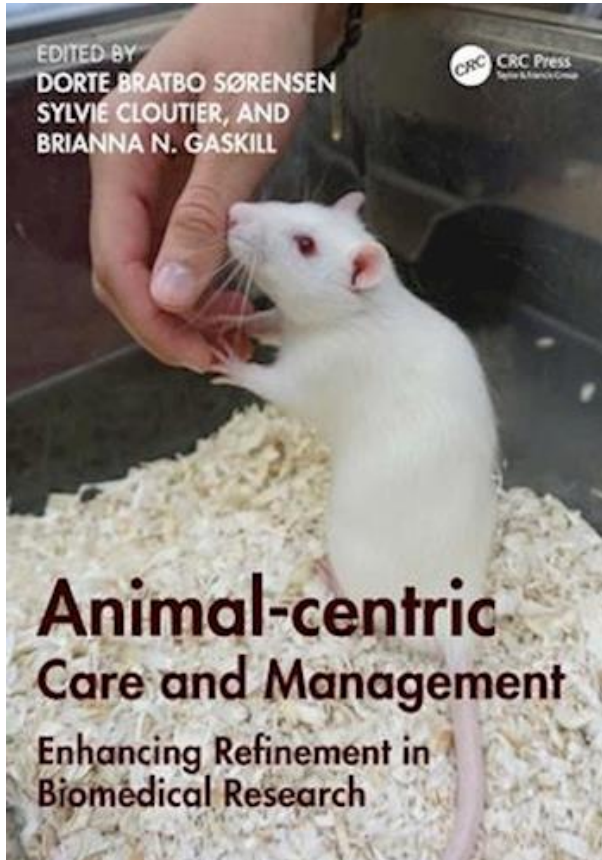
En dyrecentreret tilgang til dyreforsøg



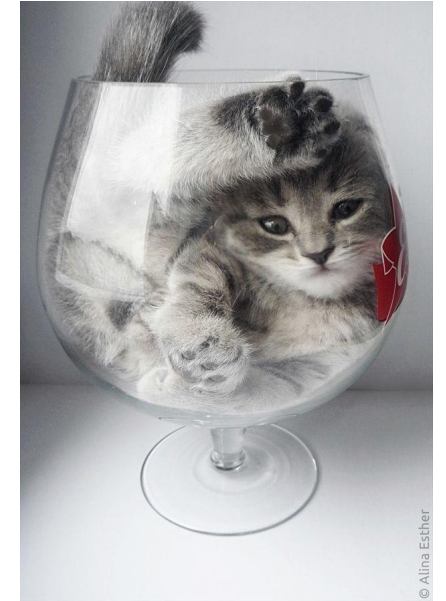
UNIVERSITY OF
COPENHAGEN

DORTE BRATBO SØRENSEN
DEPARTMENT OF VETERINARY
AND ANIMAL SCIENCE

OVERSIGT



- 3R
- Den videnskabeligt centrerede tilgang og den dyre-centrerede tilgang.
 - Science-centric vs Animal-centric
- Dyretræning som en del af en dyrecentreret tilgang.
 - Hvorfor træner vi?
 - Fordelene ved at træne dyrene
 - Træning som en del af dagligdagen
 - Træning som berigelse



3R

Russell and Burch
The Principles of Humane Experimental Techniques
1959

Replacement

Erstatning af bevidste, levende dyr med materiale uden bevidsthed.

Reduction

Reduktion i antal dyr anvendt til at opnå en bestemt mængde viden af en given mængde og præcision.

Refinement

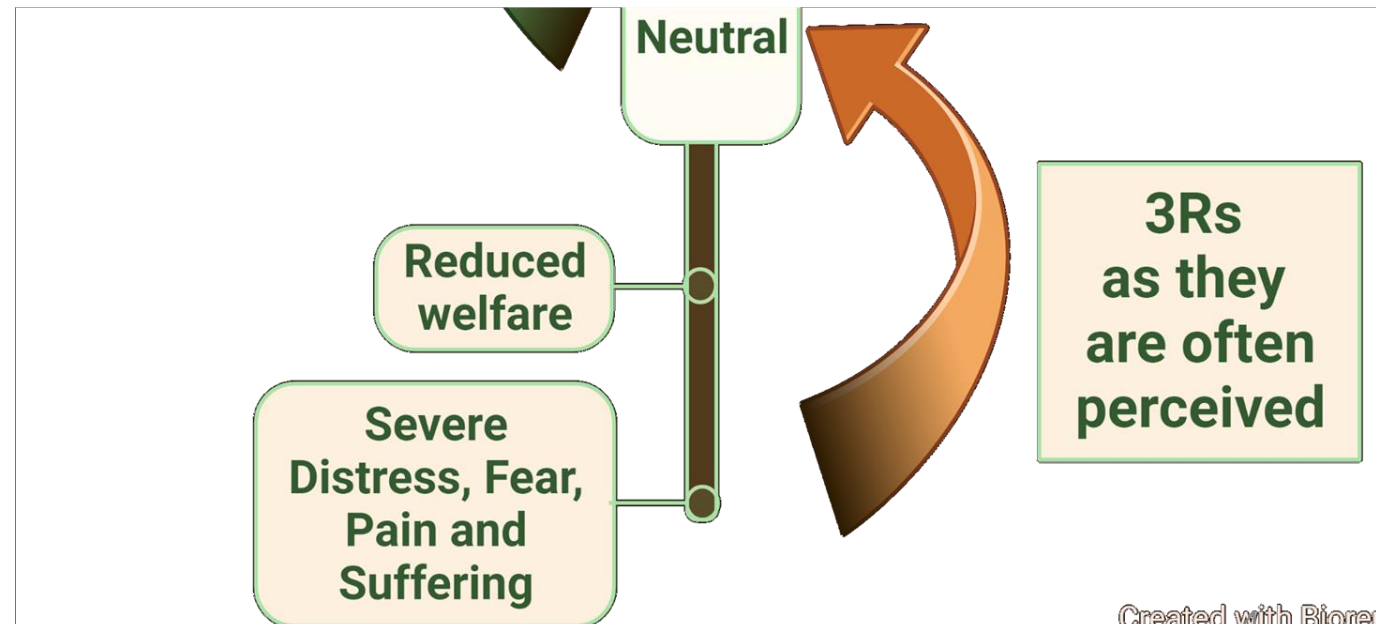
Enhver nedsættelse i antallet eller belastningsgraden af inhumane procedurer udført på de dyr, som det fortsat er nødvendigt at anvende.

3R – REMOVING INHUMANITIES Russell and Burch (1959)

3R as “Ways to diminish or remove inhumanities in experiments...”

At fjerne det negative er ikke nok.

Hvornår er noget god velfærd?



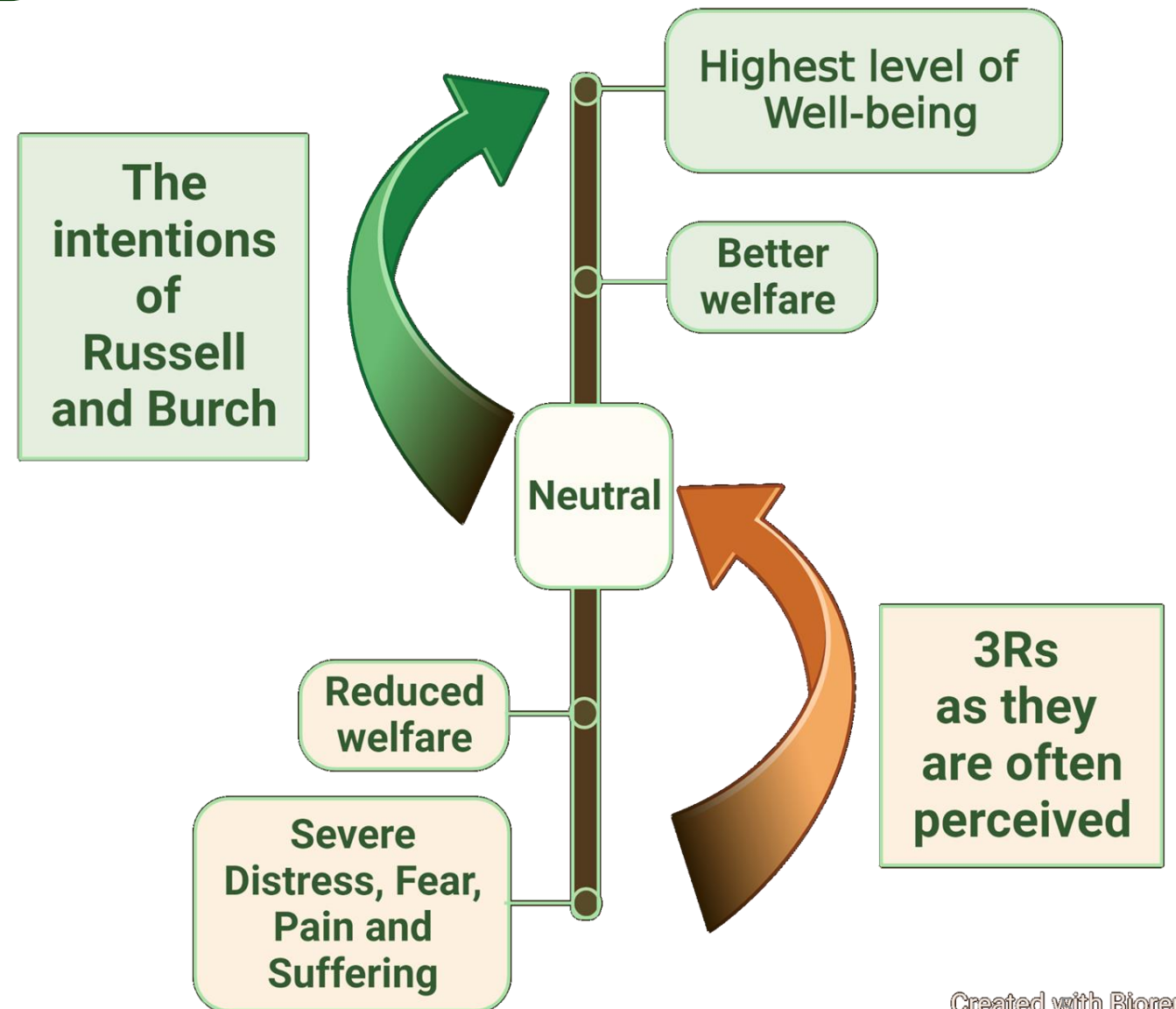
3R – FORBEDRE VELFÆRD Russell and Burch (1959)

Quote:

We can therefore begin tentatively to think of a scale of well-being to distress...

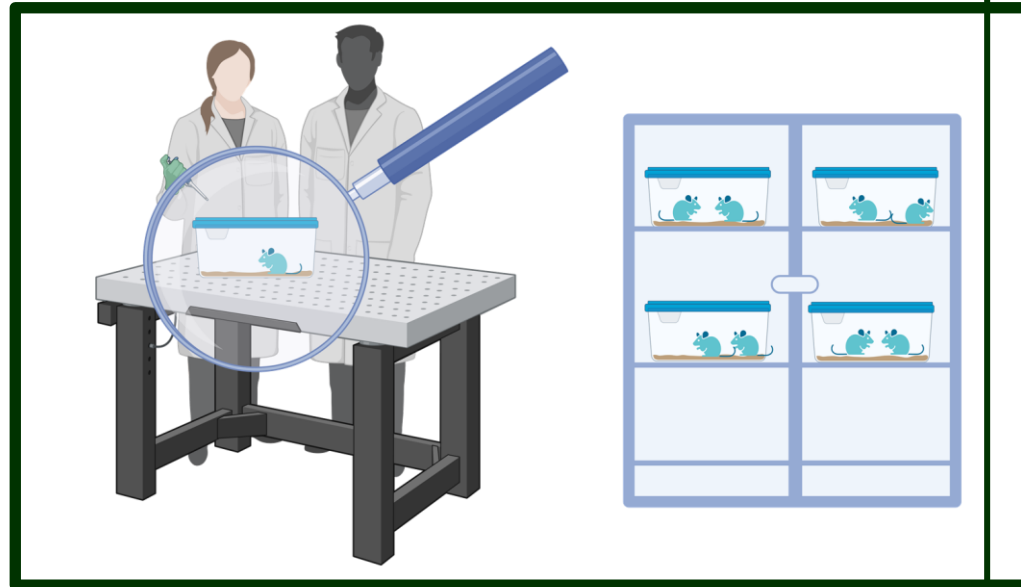
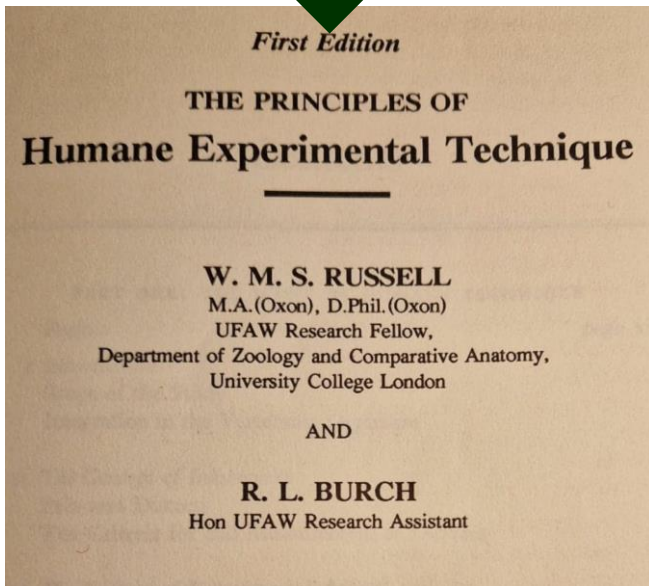
In this way we are led to set our sights high in removing inhumanity, and to attempt always to drive the animal up to the highest possible point on the scale.

Thus, we can aim at well-being rather than at mere absence of distress.



REFINEMENT OVER THE ANIMALS' ENTIRE LIFE

The title of the book of Russell and Burch (1959) prompts focus on the Experiments...



EU Directive 2010/63/EU

Member States shall ensure refinement of **breeding, accommodation and care, and of methods used in procedures**, eliminating or reducing to the minimum any possible pain, suffering, distress or lasting harm to the animals



Refinement



Any decrease in the incidence or severity of inhumane procedures applied to those animals which still have to be used



Russell and Burch

"We cannot even in principle separate husbandry from the conduct of the experiment itself" (1959)

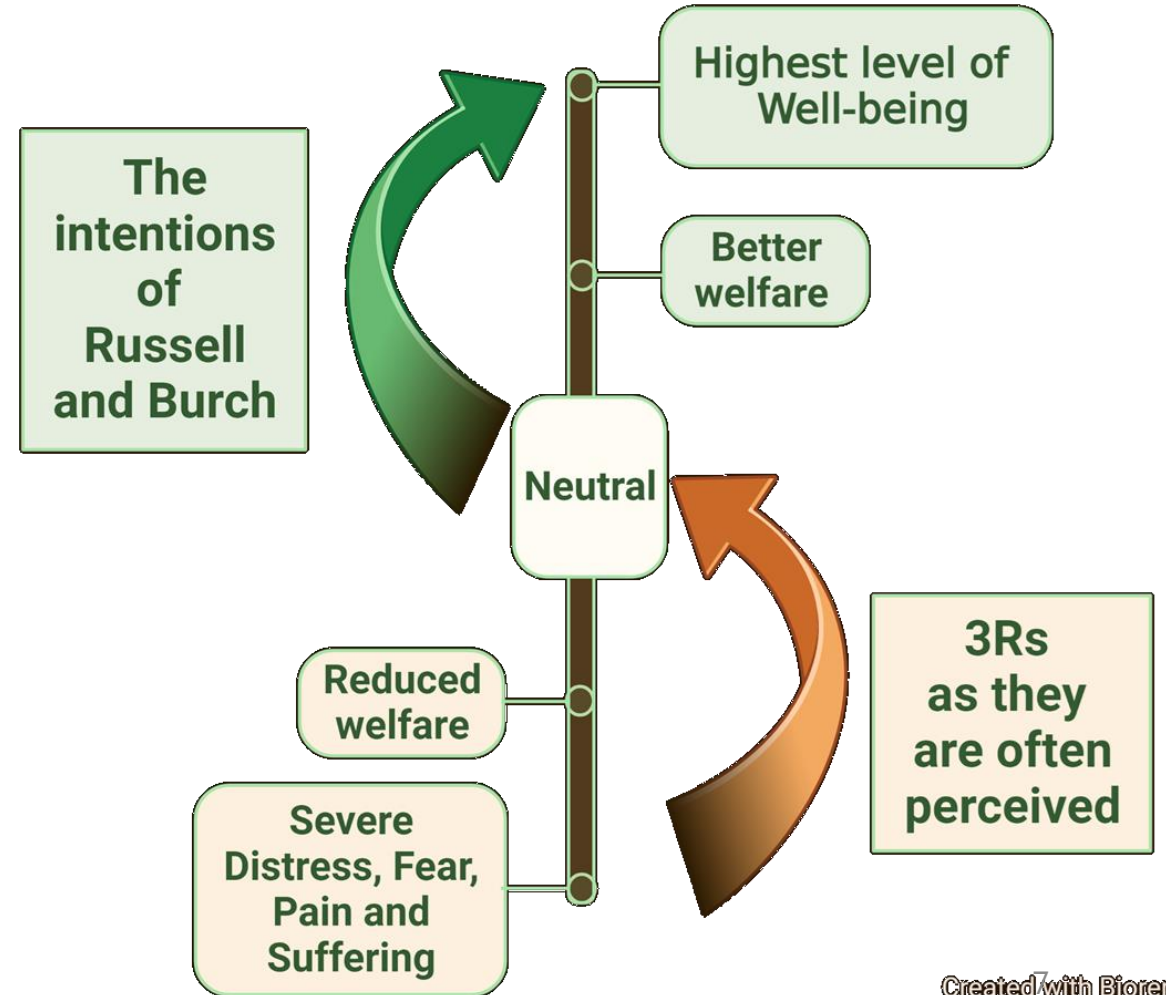
MOVING 3R FORWARD

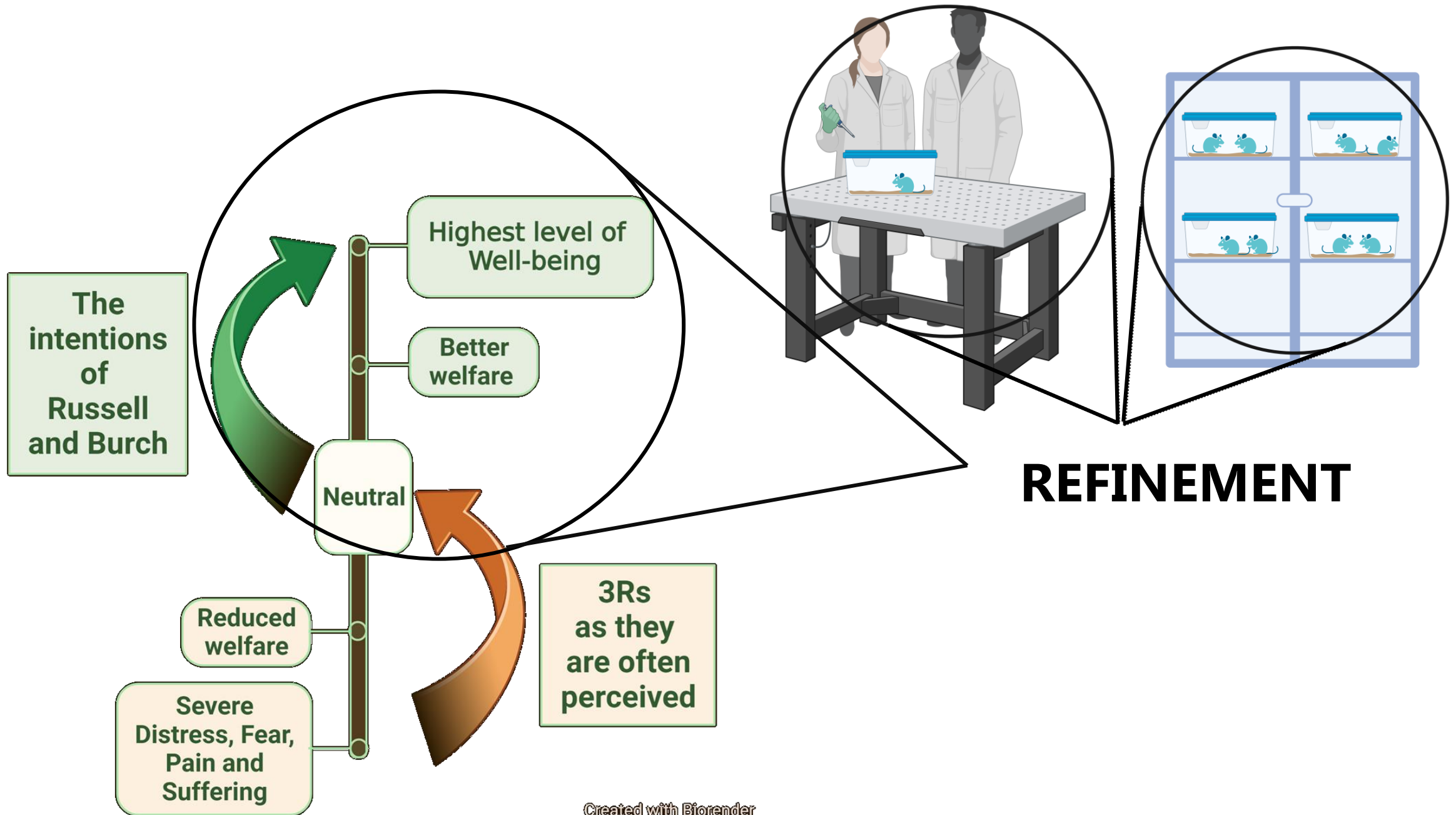
Conclusion

Animal welfare should be increased as much as possible throughout the animals' life.



=> 3R will continuously move forward





ET CENTRALT 3R SPØRGSMÅL

Russell and Burch (1959):

- *The central problem, then, is that of..... how humanity can be promoted without prejudice to scientific and medical aims*
- En Science-First/"Science-Centric" tilgang til in vivo studier.



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EN ANIMAL-CENTRIC TILGANG

Primære focus:

Dyrets behov, præferencer og følelser

1

Generel ledelses-beslutning om håndtering, opstaldning og pasnings- og procedurerutiner

2

Sikre bedst mulig baseline dyrevelfærd

3

Tilpasning af protokoller/procedure/budget til de vedtagne rammer

- Alt, som kan trænes, skal trænes
- Dosering i foder/godbidder
- Mest skånsomme mærkning

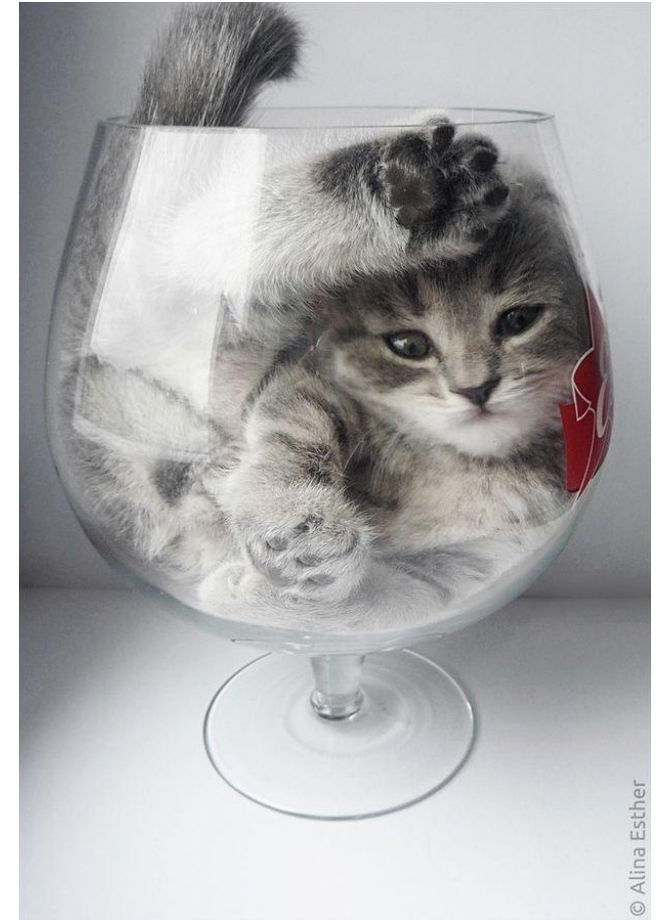


EN SCIENCE-CENTRIC TILGANG

In *vivo* studies are planned and designed with a focus on the phenomenon that is being modelled.

Focus on the experiment/study


Fitting the animal into the experimental framework



E. Coli Induced Diarrhea in Slaughter Pigs

Study Outline

- ID marking – Eartags
- Oral dosing
- Faecal sampling and blood sampling



https://www.securepork.org/Resources/Nasal_Swab_Handout_Final.pdf

THE SCIENCE-CENTRIC APPROACH

Individuel mærkning	Øremærkning
Inokulering med E. Coli	Oral dosering med sonde
Fæces-prøver	Tryneslynge
Injektioner	Tryneslynge
Blodprøver	Tryneslynge
Refining (inde i "boksen")	Legetøj, hø/halm, papkasser/papirposer

E. Coli Induced Diarrhea in Slaughter Pigs

Study Outline

- ID marking with colours
- Oral dosing in cat food
- Fecal sampling and blood sampling



THE ANIMAL-CENTRIC APPROACH

Individuel mærkning

Farvespray

Inokulering med E. Coli

Fæces-prøver

Injektioner

Blodprøver


Refining – en del af protokol



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THE ANIMAL-CENTRIC APPROACH

Individuel mærkning

Farvespray

Inokulering med E. Coli

Inokulat i blendet
kattemad

Fæces-prøver

Injektioner

Blodprøver

Refining – en del af protokol



E. Coli Induced Diarrhea in Slaughter Pigs

Study Outline



THE ANIMAL-CENTRIC APPROACH

Individuel mærkning	Farvespray
Inokulering med E. Coli	Inokulat i blendet kattemad
Fæces-prøver	Opsamling på staldgang
Injektioner	Træning
Blodprøver	Ørekateter? Træning?
Refining – en del af protokol	Træning til farve/doseringskasse, leg på staldgang, kattemad



THE ANIMAL-CENTRIC APPROACH

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**E. Coli Induced Diarrhea
in Slaughter Pigs**

THE ANIMAL-CENTRIC APPROACH

Individuel mærkning

Farvespray

Inokulering med E. Coli

**Inokulat i blendet
kattemad**

Fæces-prøver

Opsamling på staldgang

Injektioner

Træning

Blodprøver

Ørekateter? Træning?

Refining – en del af protokol

**Træning til
farve/doseringskasse, leg på
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E. Coli Induced Diarrhea in Slaughter Pigs

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THE ANIMAL-CENTRIC APPROACH

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EN ANIMAL-CENTRIC TILGANG



Each experiment is designed within the framework that makes the animal's welfare the highest priority.

DIRECTIVE 2010/63/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 22 September 2010
on the protection of animals used for scientific purposes

(31) Animal-welfare considerations should be given the highest priority in the context of animal keeping, breeding and use. Breeders, suppliers and users should

In studies where it is not possible to achieve an over-all high level of animal welfare, a high baseline level will most likely ensure that some level of welfare will be maintained.

Additional resources may be needed

- The start-up phase may be time-consuming
- Necessary to train staff in new techniques



ET SKIFT I FOKUS



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Russell and Burch (1959)

*The central problem, then, is that of....
how humanity can be promoted
without prejudice to scientific and
medical aims*



Bratbo (2023)

*The central problem, then, is that of....
how scientific and medical aims can be
promoted without prejudice to our
humanity and the welfare of the
animals*

Each experiment is designed within the framework that makes the animal's welfare the highest priority.

In studies where it is not possible to achieve an over-all high level of animal welfare, a high baseline level will most likely ensure that some level of welfare will be maintained.

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HVAD MED GNAVERE?

Samme tilgang

- Al håndtering stress-fri og gerne positiv, hvis muligt
- Dosering i foder/godbidder (Nutella, peanutbutter ...)
- Træning/habituering

Kan være en udfordring

Mange rutiner, vaner og fasttømrede holdninger på området

Kræver ressourcer til udstyr og træning af personale og tid til erfaringsudveksling

TRAINING RATS ... AFTER 6 DAYS OF TRAINING IN HOME CAGE

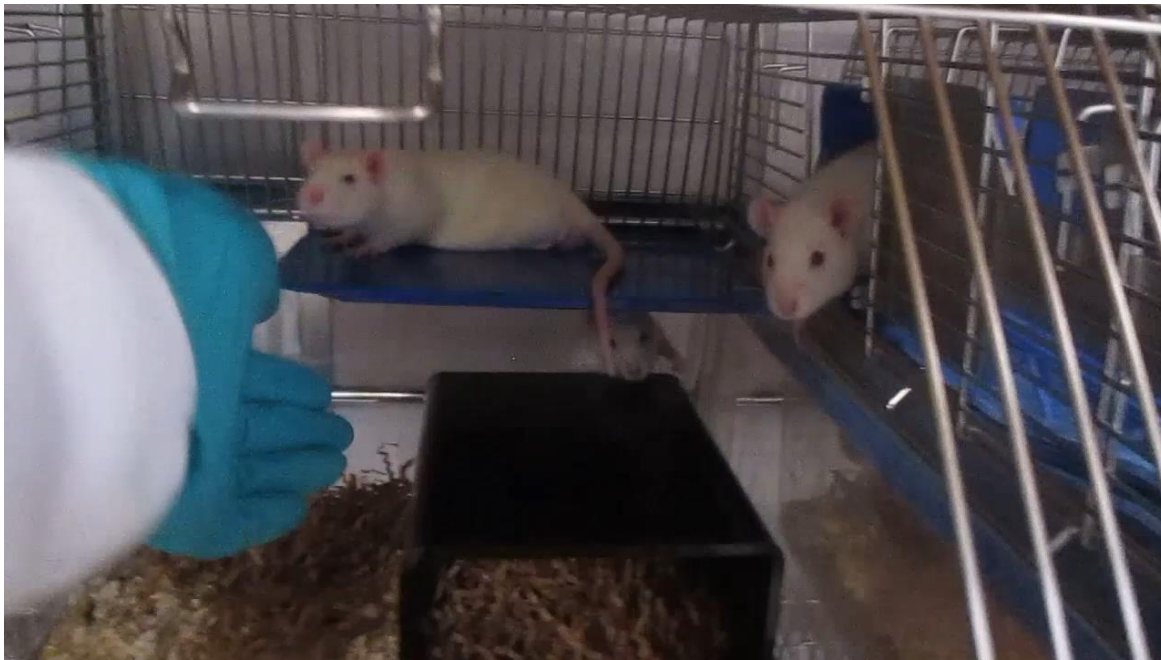


Video Courtesy Camilla Clausen, Novo Nordisk

TRAINING RATS

Training for handling.

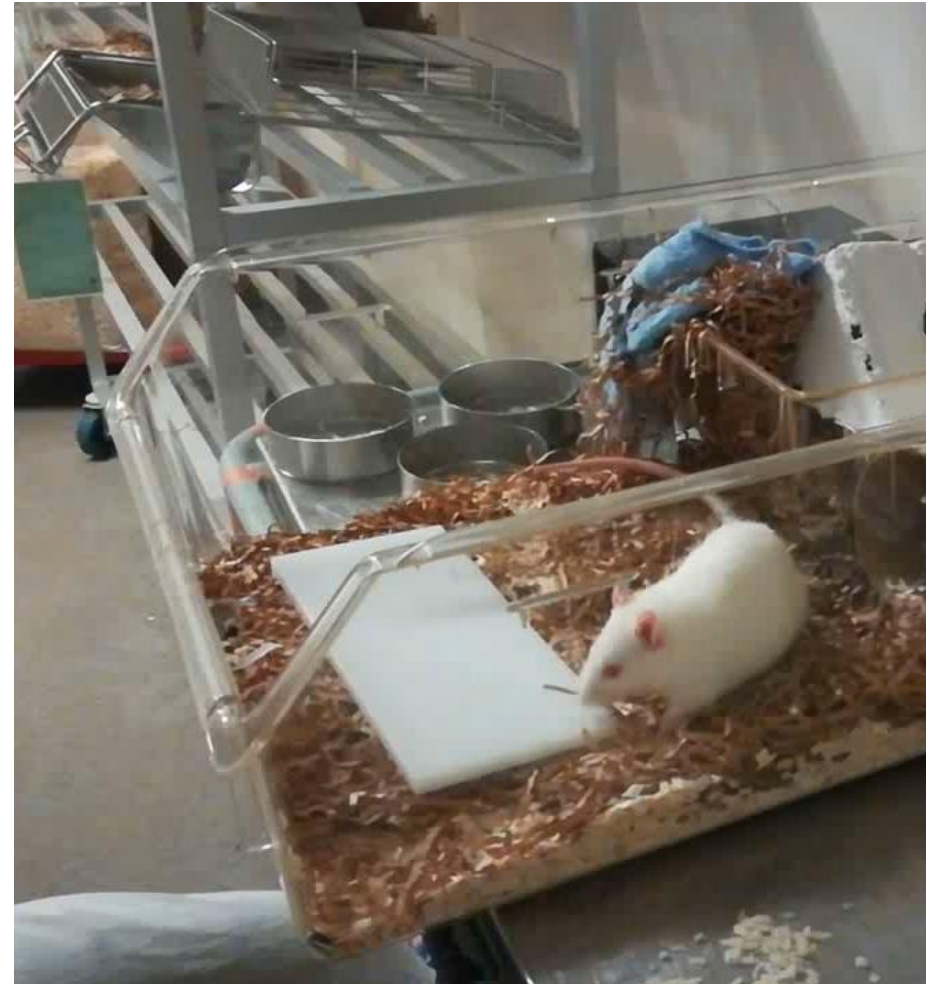
Training done during the acclimatization period. Day 1 and day 6.



Videos Courtesy Camilla Clausen, Novo Nordisk

THE BENEFITS OF ANIMAL TRAINING

- Increase the level of care and our ability to assess welfare ?
- More interaction with the animals
- Possible to detect minor drop in welfare?



TAK FOR OPMÆRKSOMHEDEN

Videoer

Tak til Novo Nordisk, København Zoo og Sofie Kromann

Billeder

Tak til Sofie Kromann

Figurer

made with Biorender

Kattebilleder

<https://grape.jpg> and www.reddit.com

Center for Laboratory Animal Training

CeLAT symposium

Dyretæning og Positiv Håndtering af Forsøgsdyr

Fredag d. 29. september 2023 kl. 9-12