Forsøksdyr: den skjulte kostnaden

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norecopa.no/kostnad

https://norecopa.no

“Det du ikke vet, har de vondt av”

peta.org

Norecopa: PREPARE for better Science

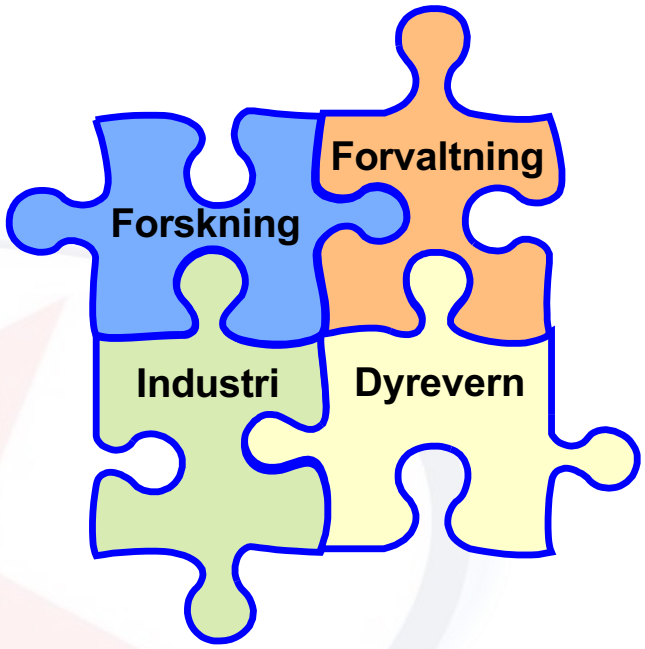
fbresearch.org

Norecopa er Norges nasjonale *konsensus*-plattform,

som skal *fremme* ***alle de tre R'ene***:

Replacement, Reduction and Refinement

Styret representerer:



Stiftet i 2007

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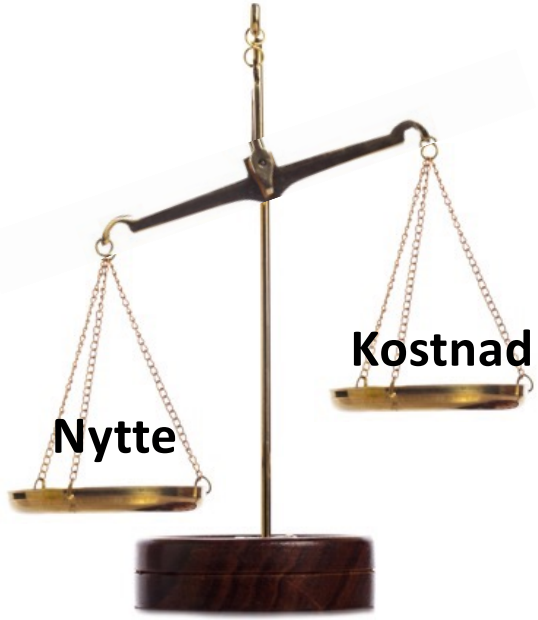
Hva er positivt med dyreforsøk?

- ✓ **Økt kunnskap** - i håp om nytte senere

- ✓ **Nytte for dyr**
  - ✓ bedre dyrevelferd
  - ✓ bedre sykdomsbehandling/profylakse

- ✓ **Nytte for mennesker**
  - ✓ bedre sykdomsbehandling/profylakse
  - ✓ HMS
  - ✓ utdannings- opplæringsøyemed
  - ✓ økonomisk gevinst



En viktig brikke i arbeidet med **Én Helse** (miljø/mennesker/dyr)

Det positive forutsetter:

- Klare og realistiske mål med forsøkene
- Korrekt eksperimentelt design – randomisering, blinding, tilstrekkelig statistisk styrke
- Korrekt statistisk analyse – ingen p-hacking!
- Ingen HARK-ing (Hypothesising after the Results are Known)
- Rapportering av **"alt"** (også negative og belastende funn) - for at ikke nye dyr skal brukes til det samme

Dirk-Jan Hoek, CC-BY.

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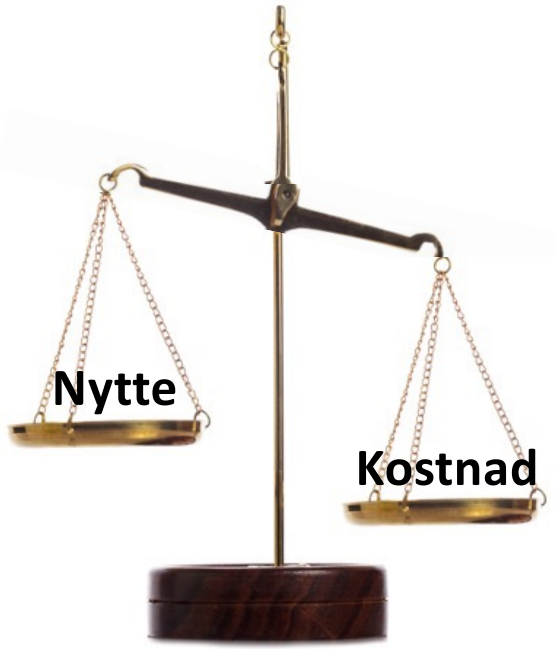
Vanlige kostnader ved alle dyreforsøk

- I motsetning til nytteverdien, som er ***i fremtiden og usikker:*** Belastningen på forsøksdyret er ***NÅ og GARANTERT***
- Den eventuelle nytteverdien hjelper sjeldent selve forsøksdyret, men (noen ganger) sine artsfrender (som i husdyrforskning - dog ofte i menneskers interesser)
- Det kan være tvil om resultatene er pålitelige



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Etter dyreforsøket

Det kan være vanskelig å vei ***kostnadene for enkeltdyrene*** opp mot ***nytteverdien for andre***

Forsøksdyret opplever ofte det stikk motsatte av "De 5 Frihetene" for dyrevelferd

- Frihet fra sult, tørste og feilernæring
- Frihet fra fysisk ubehag
- Frihet fra smerte, sjukdom og skade
- Frihet til å utøve normal atferd
- Frihet fra frykt og stress

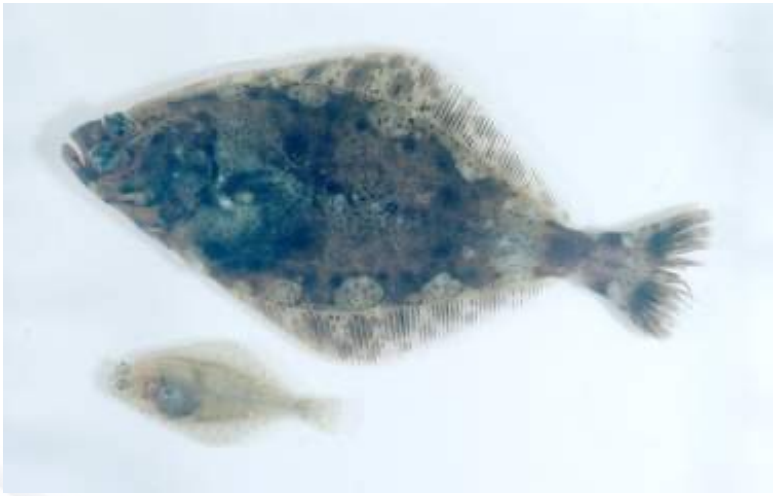
mattilsynet.no/dyr_og_dyrehold/dyrevelferd/rad_om_dyrevelferd/hva_er_dyrevelferd.5017

Fiskeforsøk har en del tilleggskostnader:

Selv enkel håndtering og enkle prosedyrer innebærer oftest å ta dem ut av sitt fysiologisk riktig element

Tilleggskostnader:

foto: T. Poppe

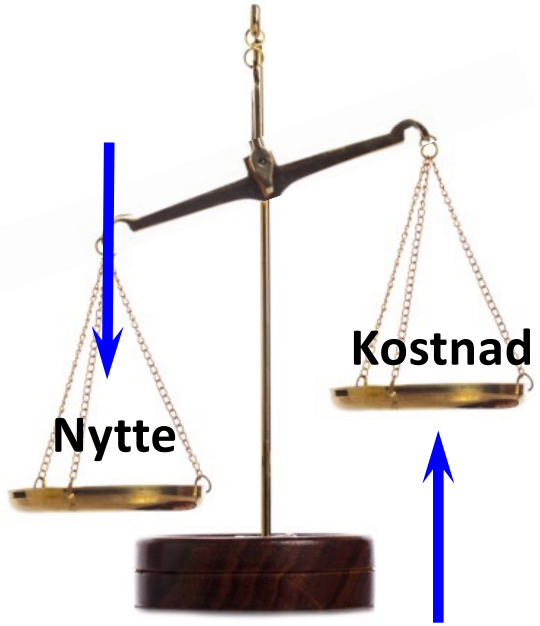


Fysiologiske endringer som de gjennomgår
Størrelsesvariasjoner mellom jevngamle dyr
Oppstallingsbehov – stim eller individuelt?
Bedøvelse og smertestillelse
m.m.

Vi kan påvirke fiskeforsøk i riktig retning

***De 3 R'ene* for å minimere belastningen:**

- *Erstatte de unødvendige forsøk*
- *Redusere antallet dyr pr. forsøk*
- *Forbedre forholdene for dyrene som må brukes*



***De 3 S'ene* - det er lov å bruke både hue og hjertet**

- *Good Science*
- *Good Sense*
- *Good Sensibilities*

***De 3 V'ene* for å øke gyldigheten av forsøket:**

- *Construct Validity (kan dyremodellen gi svaret på problemstillingen?*
- *Internal Validity (er forsøket designet riktig?)*
- *External Validity (er resultatene overførbare til måldyrene/mennesker?)*

norecopa.no/3R
norecopa.no/3S
norecopa.no/3V

Working Party Report

Guidance on the severity classification of scientific procedures involving fish: report of a Working Group appointed by the Norwegian Consensus-Platform for the Replacement, Reduction and Refinement of animal experiments (Norecopa)

P Hawkins (Convenor)[1], N Dennison[2], G Goodman[3], S Hetherington[4], S Llywelyn-Jones[5], K Ryder[2] and A J Smith[6]

[1]Research Animals Department, RSPCA, Wilberforce Way, Southwater, West Sussex RH13 9RS, UK; [2]Animals (Scientific Procedures) Inspectorate, Home Office, PO Box 6773, Dundee DD1 9WW, UK; [3]Biological Services, The University of Edinburgh, Chancellor Building, 49, Little France Crescent, Edinburgh EH16 4SB, UK; [4]CEFAS, Pakefield Road, Lowestoft, NR33 0HT, UK; [5]King's College London, Biological Services Unit, 4th floor, Hodgkin Building, Guy's Campus, London SE1 1UL, UK; [6]Norecopa, c/o Norwegian Veterinary Institute, PO Box 750 Sentrum, N-0106 Oslo, Norway
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Abstract

The severity classification of procedures using animals is an important tool to help focus the implementation of refinement and to assist in reporting the application of the 3Rs (replacement, reduction and refinement). The recently revised Directive that regulates animal research and testing within the European Union requires Member States to ensure that all procedures are classified as 'non-recovery', 'mild', 'moderate' or 'severe', using assignment criteria set out by the European Commission (EC). However, these are focused upon terrestrial species, so are of limited relevance to fish users. A Working Group set up by the Norwegian Consensus-Platform for the 3Rs (Norecopa) has produced guidance on the classification of severity in scientific procedures involving fish, including examples of 'subthreshold', 'mild', 'moderate', 'severe' and 'upper threshold' procedures. The aims are to complement the EC guidelines and help to ensure that suffering in fish is effectively predicted and minimized. Norecopa has established a website (www.norecopa.no/categories) where more information on severity classification for procedures using fish, including field research, will be made available.

Keywords: Fish, harm–benefit assessment, humane endpoints, refinement, severity

Laboratory Animals 2011; 1–6. DOI: 10.1258/la.2011.010181

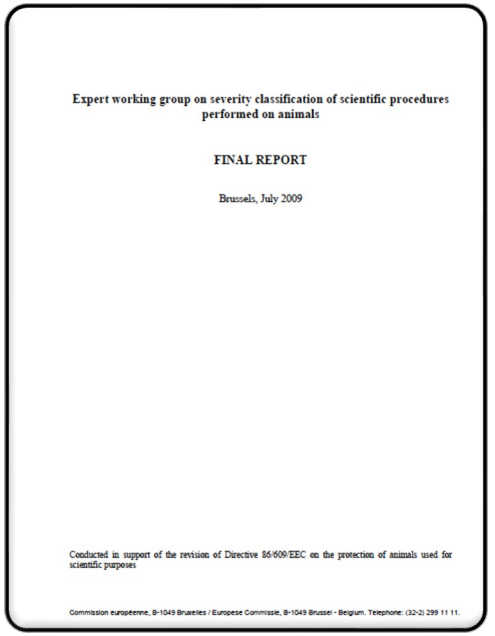
Background

An effective prediction of the effects of a research protocol on the animals concerned helps to ensure that any pain, suffering or distress they may experience will be effectively anticipated, recognized and alleviated. This is essential not only for animal welfare but also for scientific validity, because physiological and behavioural responses to suffering can significantly affect data quality. Severity classification is thus an important tool to help focus the implementation of refinement, including monitoring its progress, and to assist in reporting the application of the 3Rs (replacement, reduction and refinement) of Russell and Burch,[1] which is now an integral part of the legislation on animal research and testing in many countries. Predictions of severity are also fundamental to the harm–benefit assessments undertaken by bodies such as regulatory authorities and ethical committees when deciding whether or not a project should be licensed or funded.

There may also be a legal requirement to predict and classify severity. For example, the new Directive regulating animal use within the European Union, which must be implemented within all Member States by January 2013, requires the severity of each procedure to be classified on the basis of the 'degree of pain, suffering, distress or lasting harm expected to be experienced by an individual animal during the course of the procedure', with the aim of enhancing transparency, facilitating the project authorization process and providing tools for monitoring compliance.[2] Member States will have to ensure that all procedures are classified as 'non-recovery', 'mild', 'moderate' or 'severe' on a case-by-case basis, using the assignment

Guidance on the severity classification of procedures involving fish

Et supplement til EUs retningslinjer:



Expert working group on severity classification of scientific procedures performed on animals

FINAL REPORT

Brussels, July 2009

Conducted in support of the revision of Directive 86/609/EEC on the protection of animals used for scientific purposes

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel - Belgium. Telephone: (32-2) 299 11 11.

http://ec.europa.eu/environment/chemicals/lab_animals/pdf/report_ewg.pdf

P Hawkins, N Dennison, G Goodman, S Hetherington,
S Llywelyn-Jones, K Ryder and AJ Smith (2011)

norecopa.no/categories

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The PREPARE Guidelines Checklist

Planning Research and Experimental Procedures on Animals: Recommendations for Excellence

Adrian J. Smith[a], R. Eddie Clutton[b], Elliot Lilley[c], Kristine E. Aa. Hansen[d] & Trond Bratteli[d]

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PREPARE[1] consists of planning guidelines which are complementary to reporting guidelines such as ARRIVE[2].
PREPARE covers the three broad areas which determine the quality of the preparation for animal studies:

1. **Formulation of the study**
2. **Dialogue between scientists and the animal facility**
3. **Quality control of the components in the study**

The topics will not always be addressed in the order in which they are presented here, and some topics overlap. The PREPARE checklist can be adapted to meet special needs, such as field studies. PREPARE includes guidance on the management of [illegible] facilities, since in-house experiments are dependent upon their quality. The full version of PREPARE is available on the norecopa website, with links to global resources, at http://norecopa.no/PREPARE
The PREPARE guidelines are based on [illegible] and as best practice [illegible]

Topic	(A) Formulation of the [illegible]
1. Literature searches	☐ Form a clear hypothesis, with primary and secondary objectives. ☐ Consider the use of systematic reviews. ☐ Decide upon databases and information specialists to be consulted, and construct search terms. ☐ Assess the relevance of the species to be used, its biology and suitability to answer the experimental questions with the least suffering, and its welfare needs. ☐ Assess the reproducibility and translatability of the project.
2. Legal issues	☐ Consider how the research is affected by relevant legislation for animal research and other areas, e.g. animal transport, occupational health and safety. ☐ Locate relevant guidance documents (e.g. EU guidance on project evaluation).
3. Ethical issues, harm-benefit assessment and humane endpoints	☐ Construct a lay summary. ☐ In dialogue with ethics committees, consider whether statements about this type of research have already been produced. ☐ Address the 3Rs (replacement, reduction, refinement) and the 3Ss (good science, good sense, good sensibilities). ☐ Consider pre-registration and the publication of negative results. ☐ Perform a harm-benefit assessment and justify any likely animal harm. ☐ Discuss the learning objectives, if the animal use is for educational or training purposes. ☐ Allocate a severity classification to the project. ☐ Define objective, easily measurable and unequivocal humane endpoints. ☐ Discuss the justification, if any, for death as an end-point.
4. Experimental design and statistical analysis	☐ Consider pilot studies, statistical power and significance levels. ☐ Define the experimental unit and decide upon animal numbers. ☐ Choose methods of randomisation, prevent observer bias, and decide upon inclusion and exclusion criteria.

En sjekkliste (+ tilhørende nettsider) for bedre forskning

Topic	Recommendation
	(B) Dialogue between scientists and the animal facility
5. Objectives and timescale, funding and division of labour	☐ Arrange meetings with all relevant staff when early plans for the project exist. ☐ Construct an approximate timescale for the project, indicating the need for assistance with preparation, animal care, procedures and waste disposal/decontamination. ☐ Discuss and disclose all expected and potential costs. ☐ Construct a detailed plan for division of labour and expenses at all stages of the study.
6. Facility evaluation	☐ Conduct a physical inspection of the facilities, to evaluate building and equipment standards and needs. ☐ Discuss staffing levels at times of extra risk.
7. Education and training	☐ Assess the current competence of staff members and the need for further education or training prior to the study.
8. Health risks, [illegible]	☐ Perform a risk [illegible] all persons and animals affected [illegible] the project. [illegible] items in the study.
[illegible]	[illegible] ality control of the components in the study [illegible] ch information as possible about test substances. [illegible] easibility and validity of test procedures and the skills needed to perform them.
[illegible] animals	☐ Decide upon the characteristics of the animals that are essential for the study and for reporting. ☐ Avoid generation of surplus animals.
11. Quarantine and health monitoring	☐ Discuss the animals' likely health status, any needs for transport, quarantine and isolation, health monitoring and consequences for the personnel.
12. Housing and husbandry	☐ Attend to the animals' specific instincts and needs, in collaboration with expert staff. ☐ Discuss acclimatization, optimal housing conditions and procedures, environmental factors and any experimental limitations on these (e.g. food deprivation, solitary housing).
13. Experimental procedures	☐ Develop refined procedures for capture, immobilisation, marking, and release or rehoming. ☐ Develop refined procedures for substance administration, sampling, sedation and anaesthesia, surgery and other techniques.
14. Humane killing, release, reuse or rehoming	☐ Consult relevant legislation and guidelines well in advance of the study. ☐ Define primary and emergency methods for humane killing. ☐ Assess the competence of those who may have to perform these tasks.
15. Necropsy	☐ Construct a systematic plan for all stages of necropsy, including location, and identification of all animals and samples.

References

1. Smith AJ, Clutton RE, Lilley E, Hansen KEA & Brattelid T. PREPARE: Guidelines for Planning Animal Research and Testing. *Laboratory Animals*. 2017; DOI: 10.1177/0023677217724823.
2. Kilkenny C, Browne WJ, Cuthill IC *et al.* Improving Bioscience Research Reporting: The ARRIVE Guidelines for Reporting Animal Research. *PLoS Biology*. 2010; DOI: 10.1371/journal.pbio.1000412.

Further information
https://norecopa.no/PREPARE / *post@norecopa.no* / @norecopa

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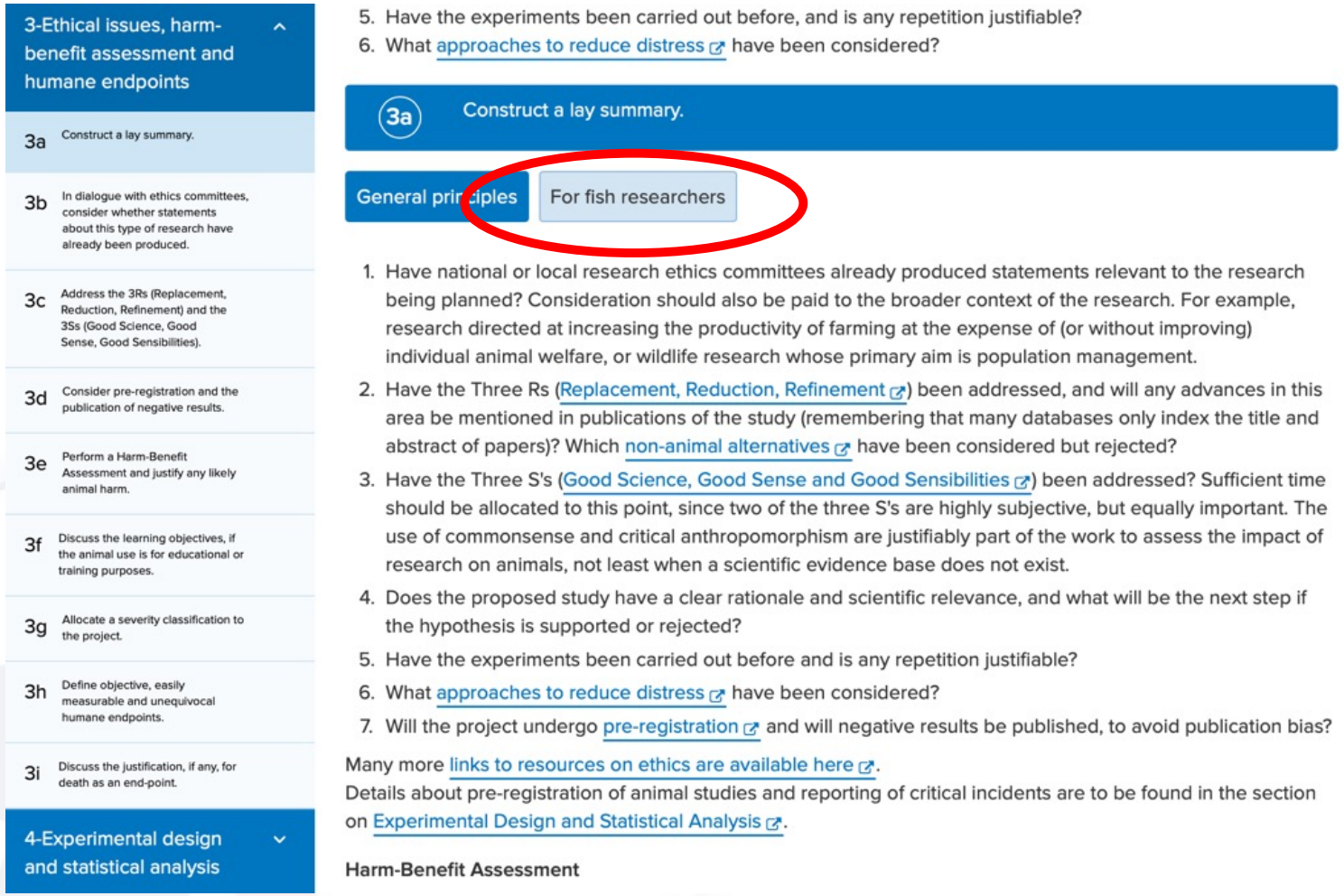

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Bruk av forsøksdyr (2021)

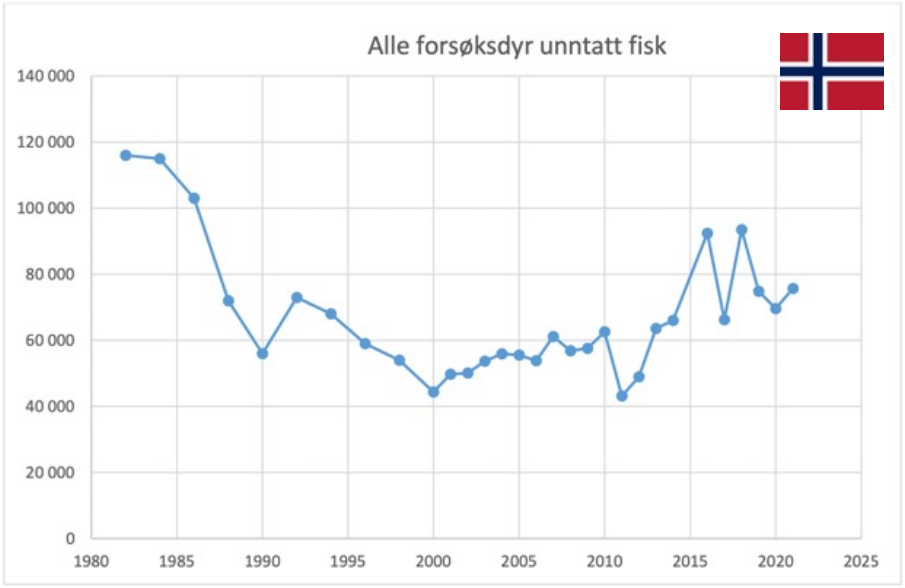
Antallet forsøksdyr er innrapporterte tall fra forskere og forsøksdyrvirksomheter.

Art	Antall
[A1] Mice (Mus musculus)	52 554
[A2] Rats (Rattus norvegicus)	4 498
[A3] Guinea-Pigs (Cavia porcellus)	120
[A4] Hamsters (Syrian) (Mesocricetus auratus)	30
[A7] Other Rodents (other Rodentia)	1 174
[A8] Rabbits (Oryctolagus cuniculus)	20
[A10] Dogs (Canis familiaris)	41
[A12] Other carnivores (other Carnivora)	139
[A13] Horses, donkeys & cross-breeds (Equidae)	92
[A14] Pigs (Sus scrofa domesticus)	705
[A15] Goats (Capra aegagrus hircus)	404
[A16] Sheep (Ovis aries)	569
[A17] Cattle (Bos primigenius)	294
[A27] Other Mammals (other Mammalia)	678
[A28] Domestic fowl (Gallus gallus domesticus)	867
[A29] Other birds (other Aves)	12 992
[A30] Reptiles (Reptilia)	10
[A33] Other Amphibians (other Amphibia)	500
[A34] Zebra fish (Danio rerio)	29 574
[A35] Other Fish (other Pisces)	2 186 386
SUM	**2 291 647**

Vaksineutvikling og testing
Utprøving av nye systemer for oppdrett
Forskning på dyrevelferd
Bekjempelse av lakselus

mattilsynet.no/dyr_og_dyrehold/dyrevelferd/forsoksdyr/bruk_av_dyr_i_forsok_i_2021.47085/binary/Bruk%20av%20dyr%20i%20forsøk%20i%202021

i takt med oppdrettsnæringens utfordringer



Statistikken er lik for alle dyrearter:

- Belastningskategoriene er de sammen
- Vanlig merking er ikke dyreforsøk
- Observasjoner er ikke dyreforsøk
- Det telles kun fisk som utsettes for prosedyrer

https://www.mattilsynet.no/dyr_og_dyrehold/dyrevelferd/forsoksdyr/bruk_av_dyr_i_forsok_i_2021.47085/binary/Bruk%20av%20dyr%20i%20forsøk%20i%202021

Norge og EU

	2015	2016	2017	2018 (EU-28 incl. NO) [2]	2019 (EU-28 incl. NO)[2]
Total	9,590,379	9,817,946	9,388,162	10,572,305	**10,401,673**

Table 1: Total numbers of animals used for the first time for research, testing, routine production and education purposes in the Union between 2015 and 2019 with the inclusion of data from Norway in 2018 and 2019

År	Sebrafisk	Alle fisk (inkl. sebrafisk)	Andre arter	Total
2003		796 497	53682	850 179
2004		267 375	55415	322 790
2005	2160	944 874	55552	1 000 426
2006	6049	670 235	53858	724 093
2007	4906	3 400 694	61170	3 461 864
2008	960	1 865 090	56862	1 921 952
2009	922	1 730 594	57579	1 788 173
2010	3355	1 357 795	62590	1 420 385
2011	1990	1 579 589	43125	1 622 714
2012	889	161 380	48986	210 366
2013	1551	5 458 434	63557	5 521 991
2014		4 823 202	65989	4 889 191
2015		1 140 975	89857	1 230 832
2016	8778	11 513 785	92383	11 606 168
2017	20724	1 093 413	66254	1 159 667
2018	38218	1 593 191	93467	1 686 658
2019	41148	1 206 789	74806	1 281 595
2020	38867	2 213 101	69609	2 282 710
2021	29574	2 215 960	75687	2 291 647
f.o.m. 2003		**44 032 973**	**1240428**	**45 273 401**

45 millioner forsøksdyr *siden den forrige dyrevelferdsmeldingen:*

- *44 millioner fisk*
- *1,24 millioner landdyr*

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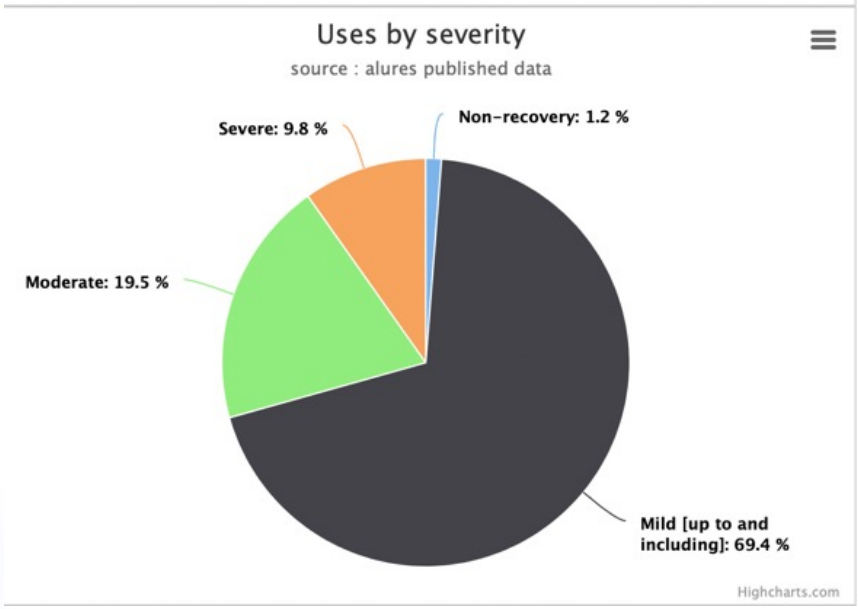
Norge: belastende dyreforsøk (tall fra 2019):

Uses of animals in research, testing, routine production and education (including training) by severity

Severity	Number of uses	Percentage
Non-recovery	36585	2.88%
Mild [up to and including]	866946	68.28%
Moderate	274767	21.64%
Severe	91434	7.2%
Total	1269732	100.00%



"Andre fisk" (ikke sebrafisk) i hele EU+Norge i 2019:
201.100 i betydelig belastende forsøk
400.000 i moderat belastende forsøk


Hvem vil ta kostnaden?
- Det norske forbruket av forsøksdyr er formidabelt. Vi må redusere denne bruken av levende dyr til eksperimenter som er strengt vitenskapelig nødvendig, sier landbruksminister Lars Sponheim til BT.
2003

Siden den forrige dyrevelferdsmeldingen...

2001-2005	Bondevik II	H, KrF, V
2005-2013	Stoltenberg II	**A**, **Sp**,SV
2013-2021	Solberg	H, FrP, V, KrF
2021-	Støre	**A**, **Sp**

Andre saker opptar stadig politikernes oppmerksomhet...

- *pelsdyr*
- *gris*
- *kyllinger*
- *veterinærvakten*

- *krigen i Ukraina*
- *energikrisen*
- *økningen i sosialutgifter*

...som fører til andre skjulte kostnader...

Arbeidstimer til:

- Lobbyvirksomhet
- Medieinnslag
- Leting etter støtte

Gratisarbeid

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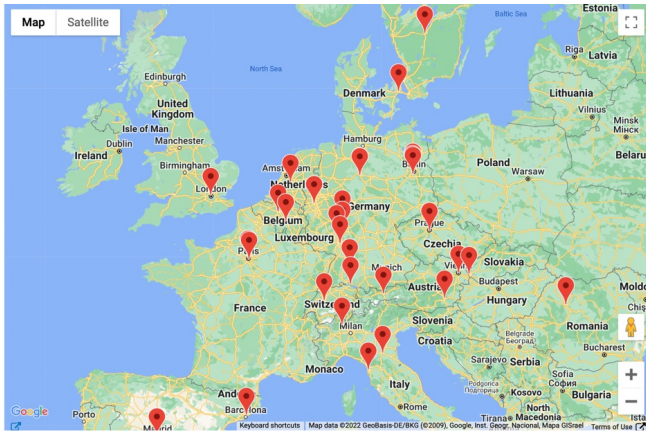
Det er bare fisk...?

...men vi bruker også relativt sett mange pattedyr, i et land uten stor farmasøytisk industri

Vi ser frem til en ny dyrevelferdsmelding i 2023



Den forrige meldingen (2003):

Landbruksdepartementet vil derfor bidra til at det opprettes en nasjonal plattform, et kompetansesenter, for alternativer til bruk av dyr i forskning slik det nå gjøres i en rekke europeiske land.

En slik plattform vil spre informasjon om alternativer nasjonalt og internasjonalt og vil selv kunne initiere utvikling av alternative metoder og bedre oppstallingssystemer.

Mine konklusjoner

1. *Det utvikles stadig nye 3R-alternativer til dyreforsøk, også i Norge*

2. *Vi kan få ned antallet dyr, og belastningen, med en større innsats*

3. *Vi trenger er **en solid norsk plattform, et 3R-senter,** som kan bidra til dette arbeidet.*

Takk for meg – og til forsøksdyrene

norecopa.no/kostnad

Nyhetsbrev - nederst på **norecopa.no**