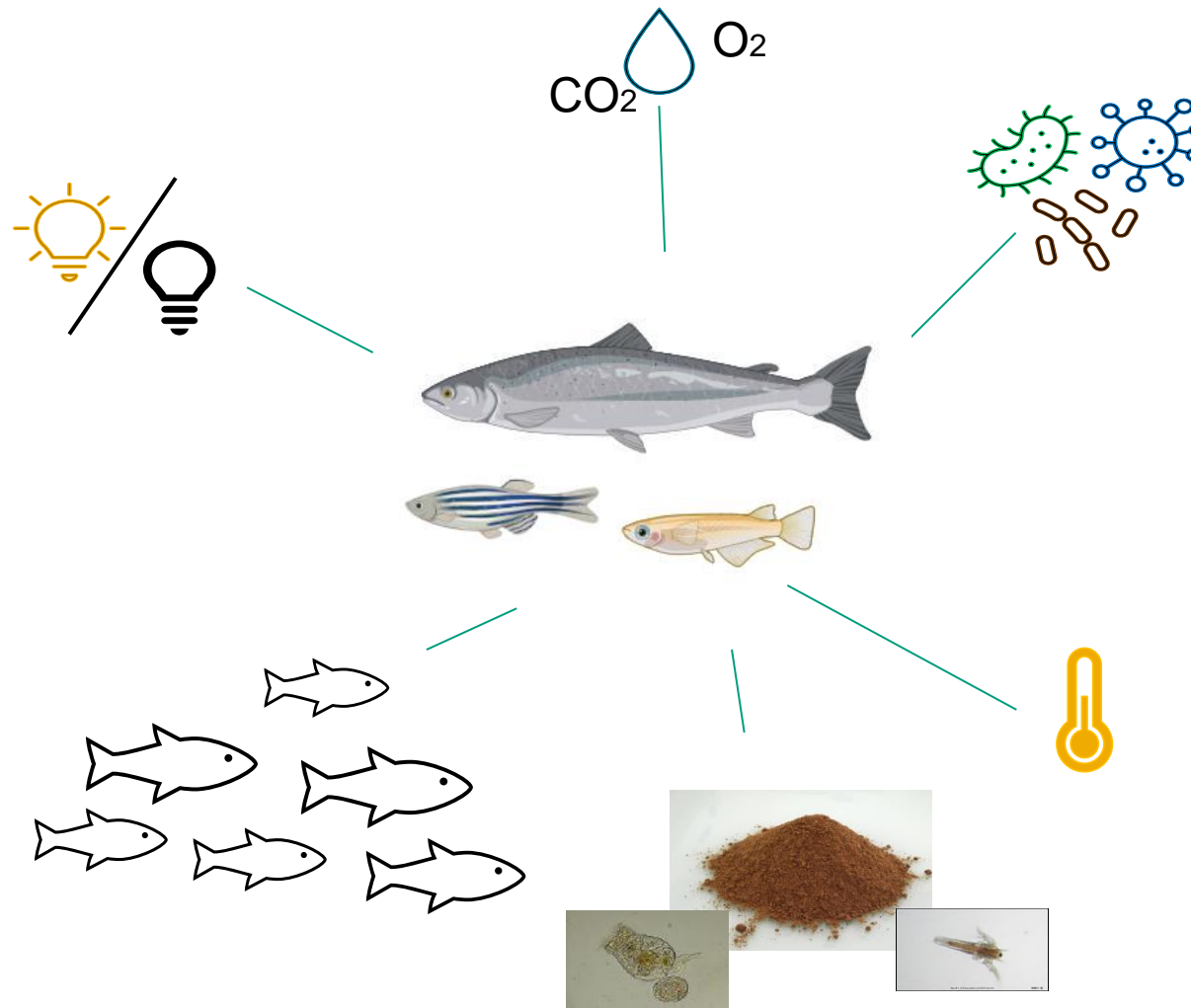


Miljøberikelse til fisk

Evgenia Dunaevskaya, stipendiat Veterinærhøgskolen, NMBU

14.03.2024, Veterinærdagene, Bergen

Fiskens forhold



Forhold VS Miljø



Miljøberikelse



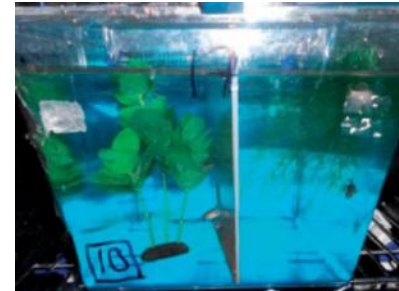
En måte å forbedre fisk velferd (livskvalitet) via tilsetning av spesielle struktur/objekter.



(Krogh, Sørensen et al. 2010)



(Schroeder, Jones et al. 2014)

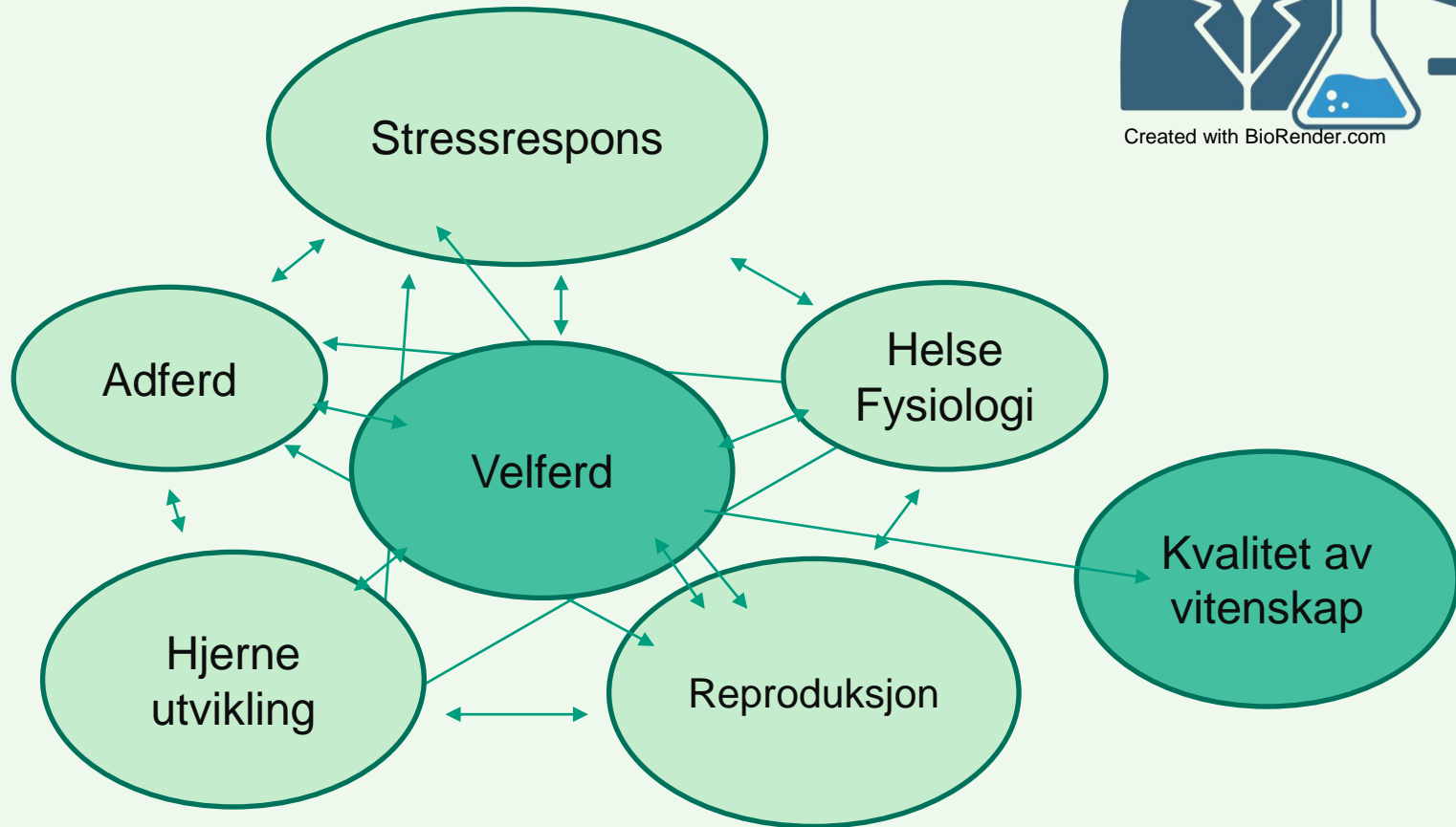
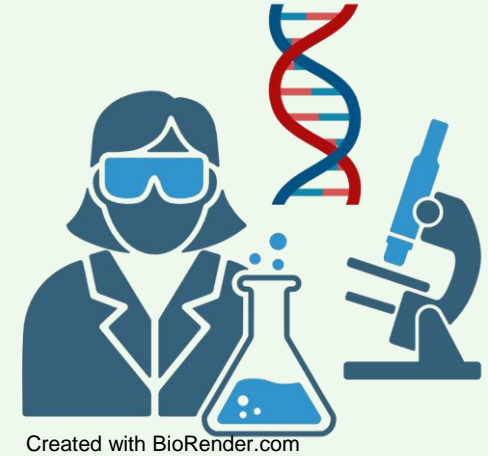


Mål: skape et miljø for dyrene som tilfredsstiller flest mulig av deres naturlige behov.



(Sundin, Morgan et al. 2019)

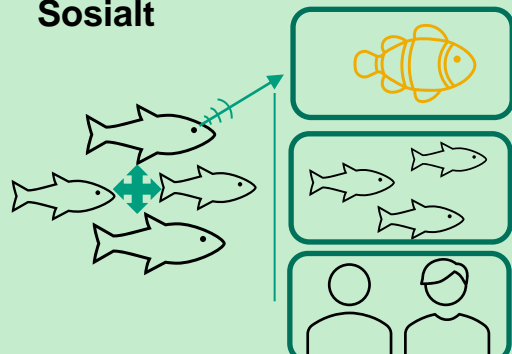
Miljøberikelse, velferd og vitenskap



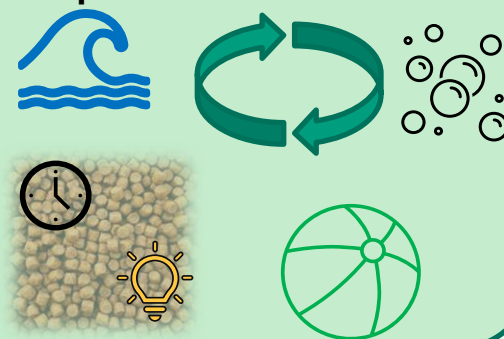
Miljøberikelse



Sosialt



Occupational



Fôringsberikelse



Fysisk (strukturell)



Sensorisk





Dyrevernalliansen

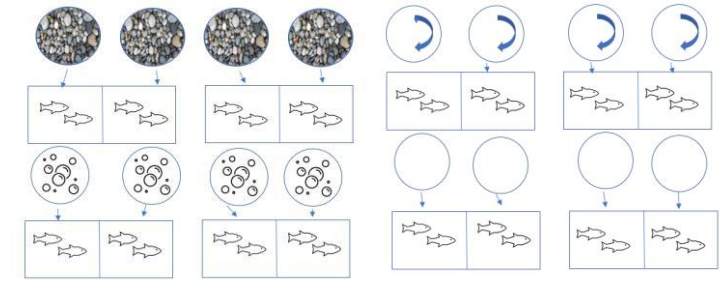
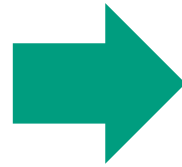
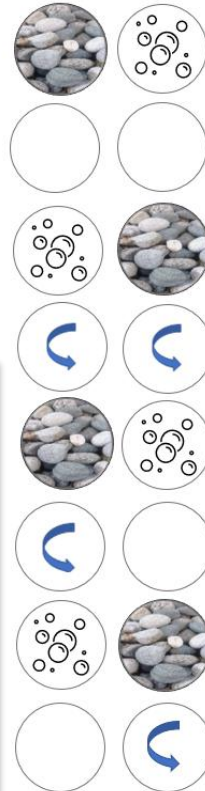
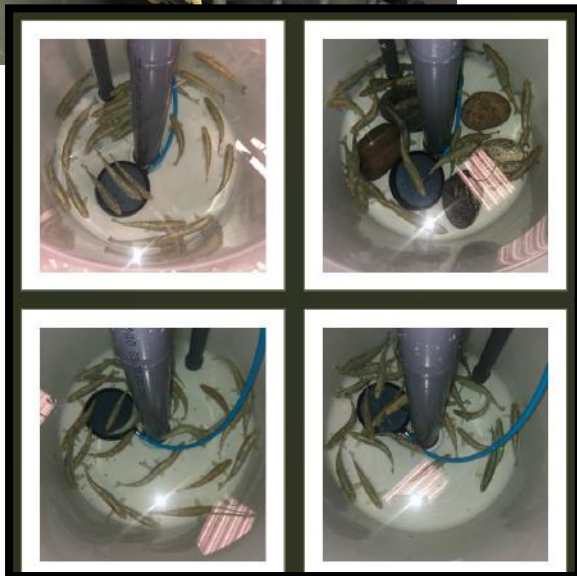
Environmental enrichment affects responses to novelty in juvenile Atlantic salmon



Evgenia Dunaevskaya ^a, Eirill Ager-Wick ^a, Ian Mayer ^a, Ruth Catriona Newberry ^b, Judit Vas ^b, Marco Antonio Vindas ^a

^a Faculty of Veterinary Medicine, Norwegian University of Life Sciences, Elizabeth Stephansens vei 15, 1433 Ås, Norway

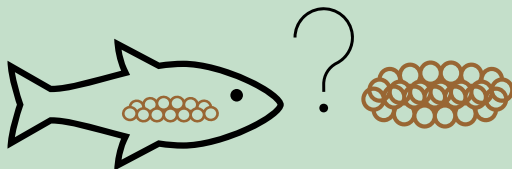
^b Faculty of Biosciences, Department of Animal and Aquacultural Sciences, Norwegian University of Life Sciences, Oluf Thesens vei 6, 1433 Ås, Norway



Analyse av spiseadferd

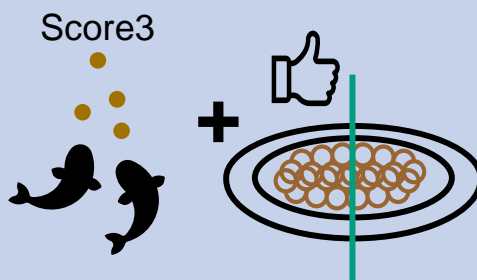
Feeding

- 1% of body weight
- 0,5 g (50 pelletes)
- Count N of eaten pellets



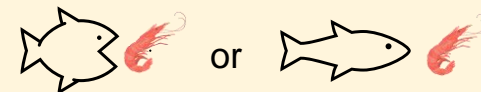
Effective feeding

- Score 3 (active feeding)
- >50% of daily ration



Novel feed

- Cooked shrimps pieces
- *Pandalus borealis*
- 30 min after feeding
- Eat or not analysis

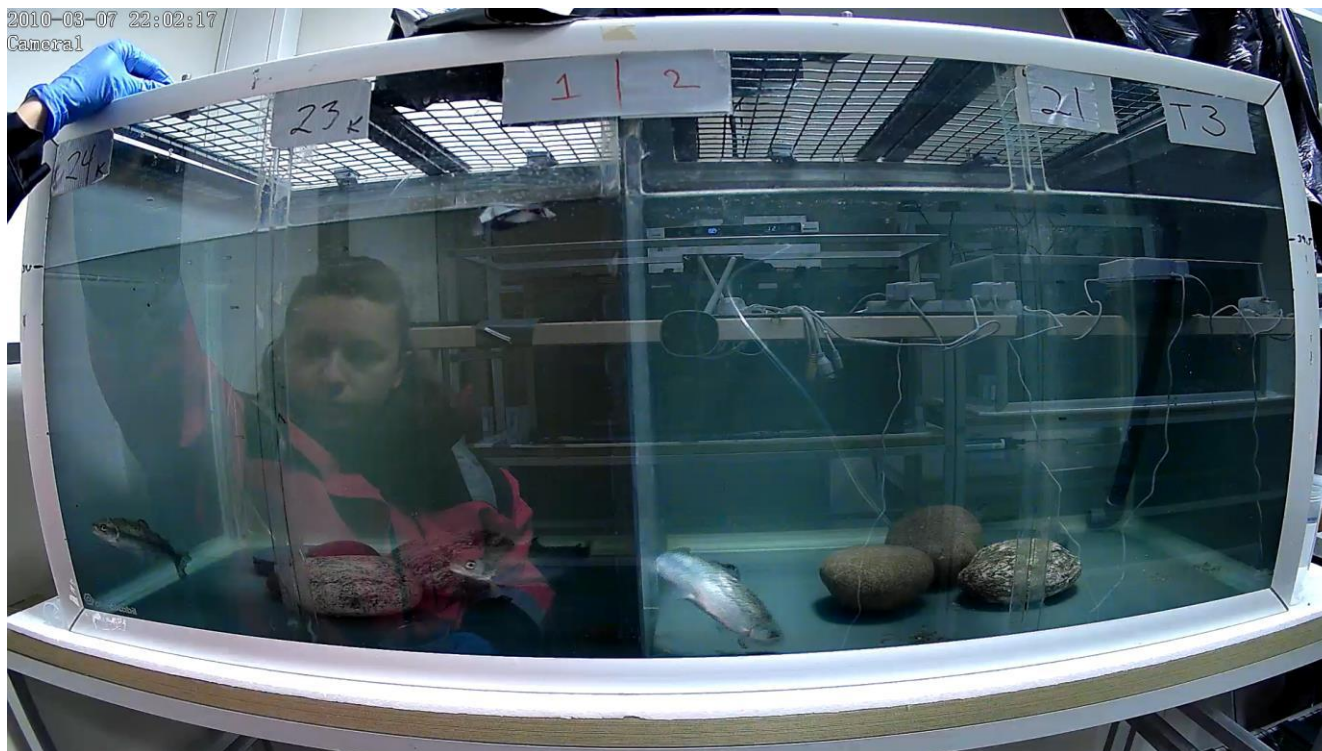


Scoring av spiseadferd

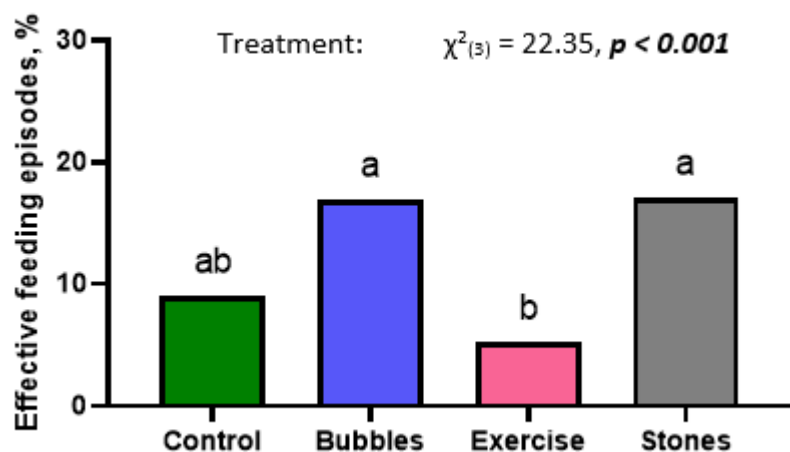


Score 3 – Aktiv spising

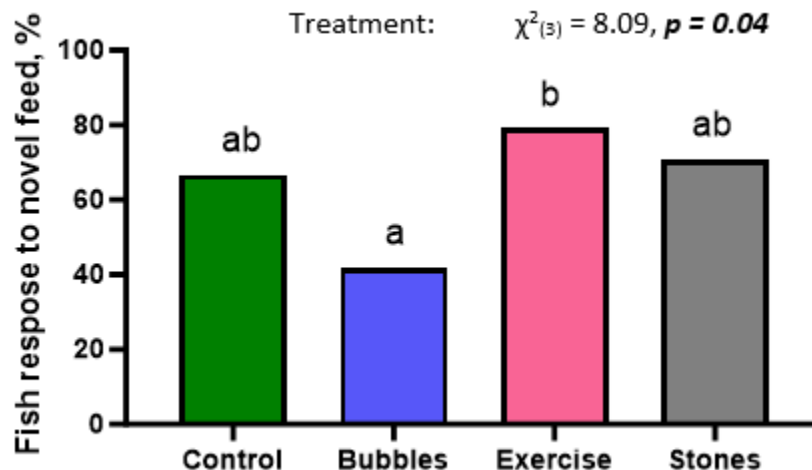
Svømming til top og bunn to spise så mye pelleter som mulig samtidig



Resultater



The percent of effective feeding episodes was dependent on enrichment treatment



Active acceptance of novel food was higher in the exercise group



Miljøberikelse i løpet av 40 dager av pre-smolt periode er viktig for laks til å takle med nytt miljø

Miljøberikelse tap har negativt effekt til å takle med ny miljø

Forståelse av subjektive preferanser til modellfisk ved å gi dem valg av forskjellige typer miljøberikelse



I. Preferanse for fysisk berikelse



Environmental
Enrichment (EE)



2Images



Image (only bottom)



Control (barren)

Videoanalyser

Day1

- 09:00

Feeding

- 10:00

- 16:00

Day2

- 09:00

Feeding

- 10:00

- 16:00

Day3

- 09:00

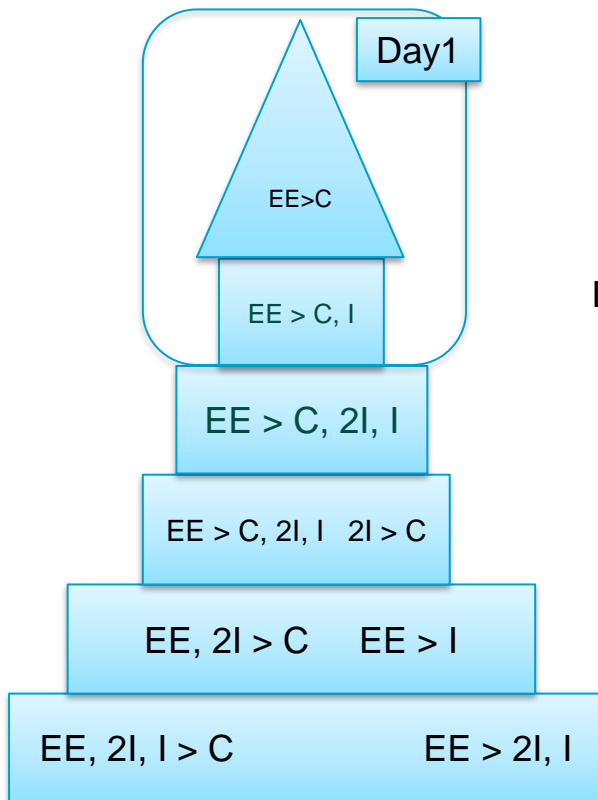
Feeding

- 10:00

Gjennomsnitt antall fisk i hver arm
i løpet av 5 minutter



Resultater



Day 1 - Walls removed 09:00

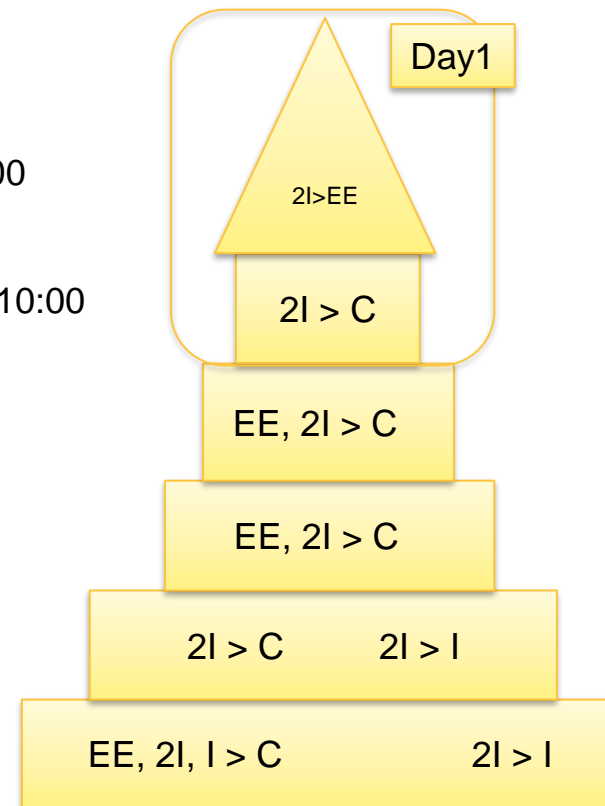
Day 1 - 1h after walls removed 10:00

09:00 Average

10:00 Average

16:00 Average

Average all timepoints



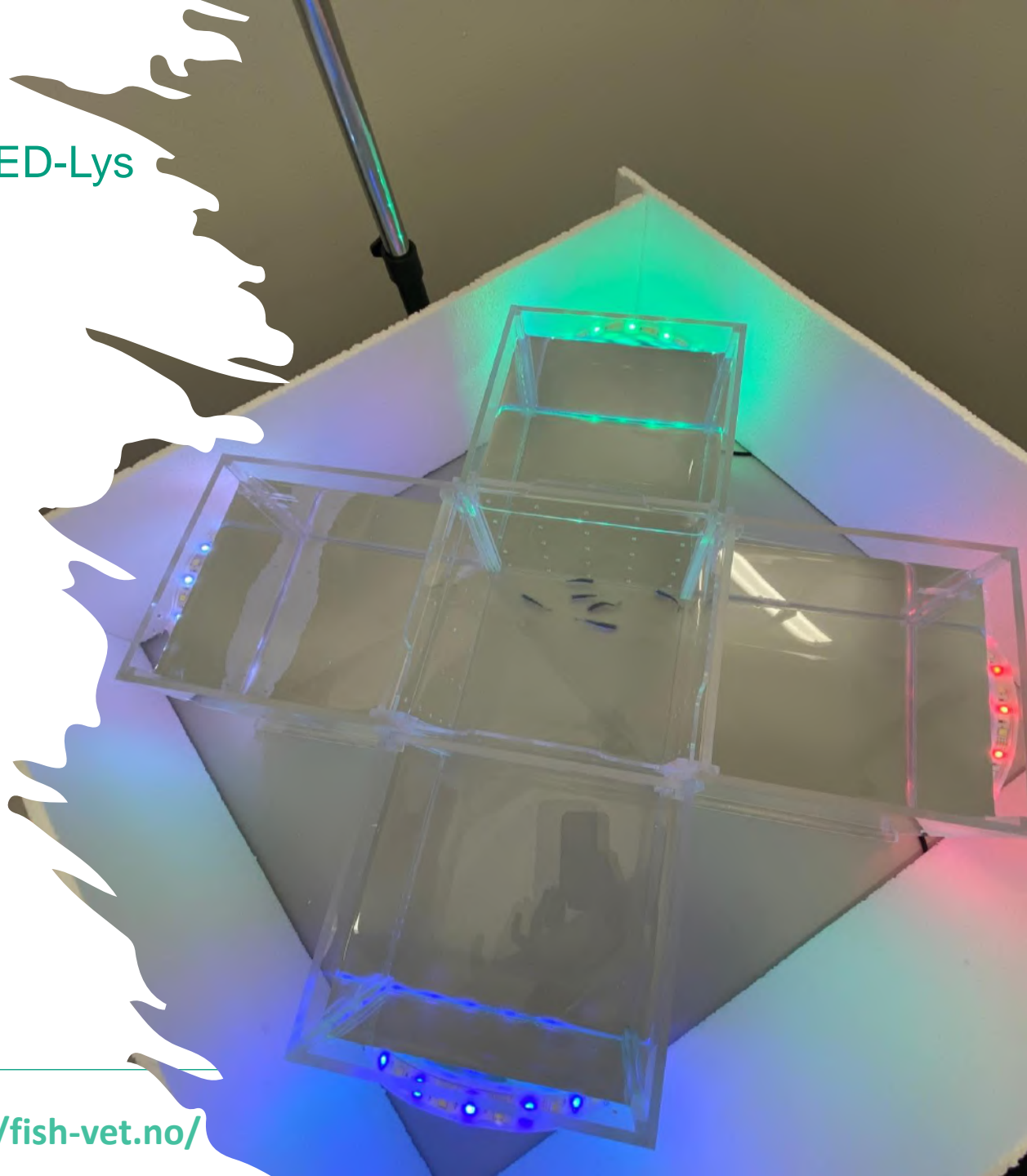
Begge arter foretrekker beriket miljø

II. Preferanse for farget LED-Lys

- Room top light
- +
- LED light at each arm:
 - Red (635nm)
 - Blue (460nm)
 - Green (515nm)
 - White (R+G+B)

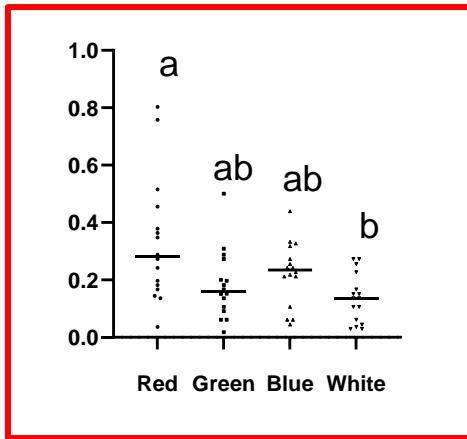


➤ <https://fish-vet.no/>

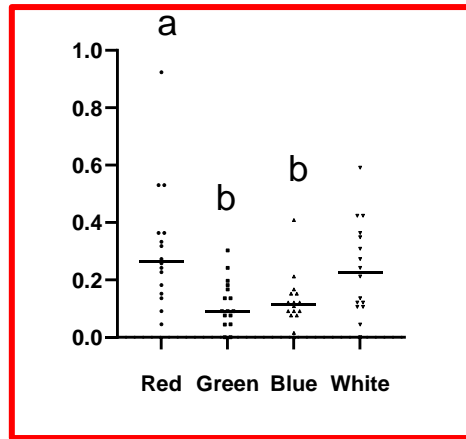




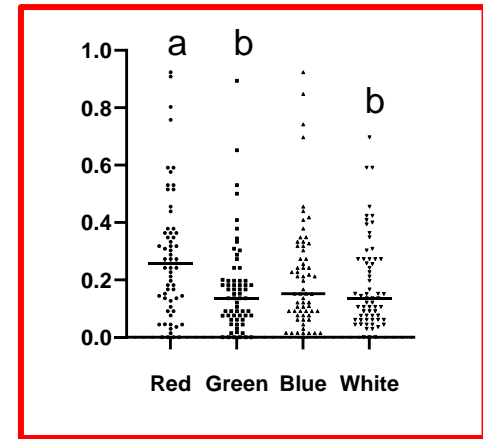
Resultater



10:00



16:00



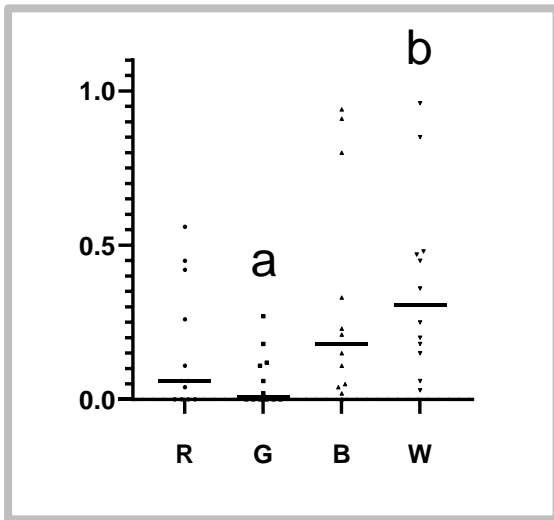
All timepoints



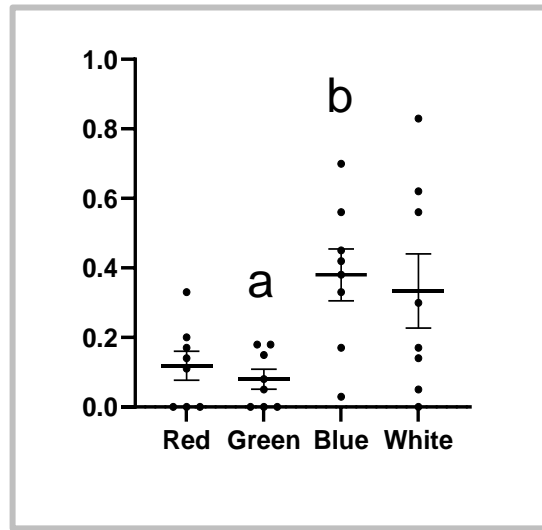
Zebrafisk preferanse for rødt lys over grønt?



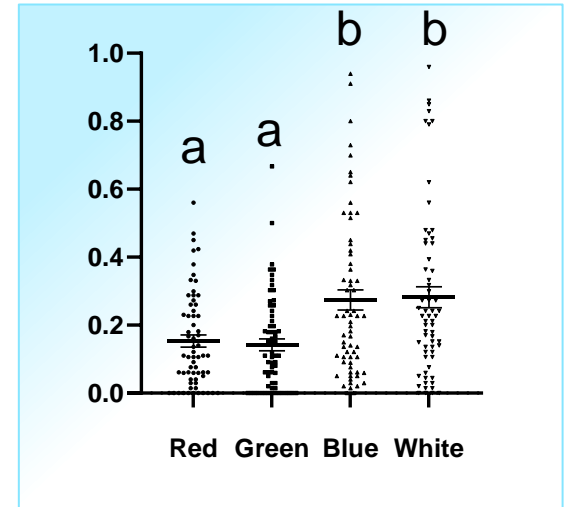
Resultater



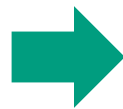
10:00



16:00



Alle tidspunkter



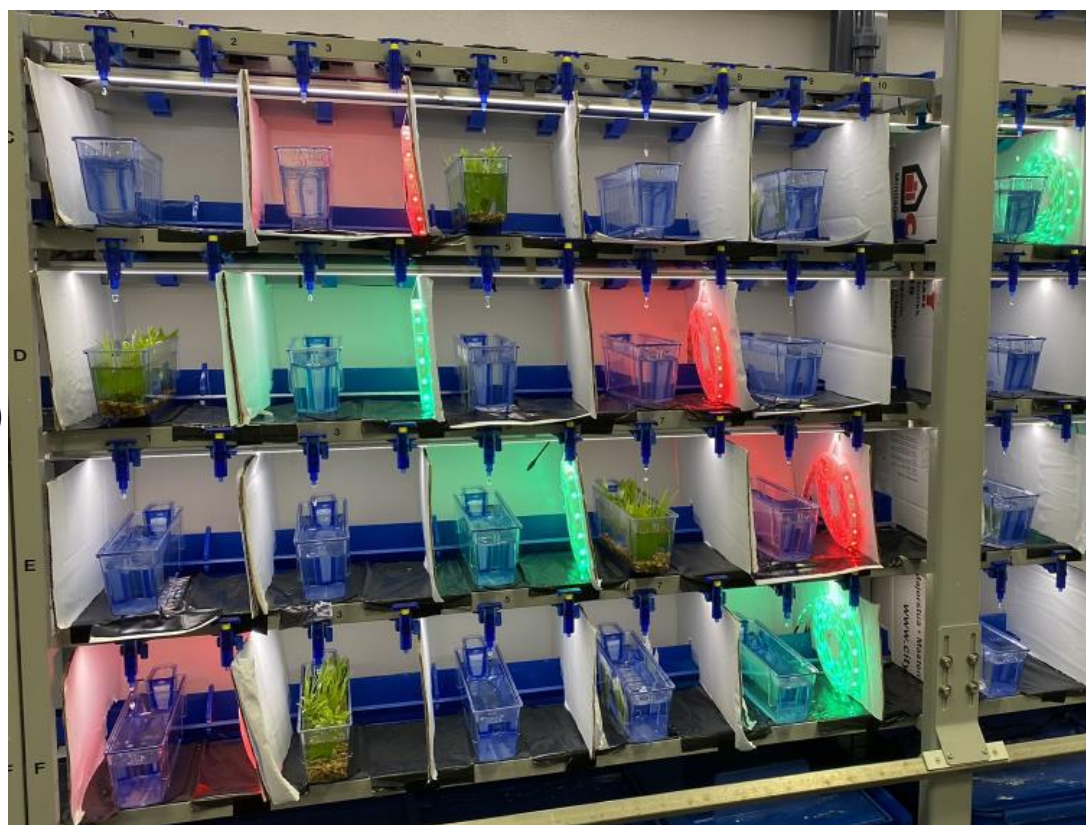
Medaka foretrekker blått og hvit lys

Kommende eksperiment

Fra nyklekket larver til fisk i reproduksjon alder
6 typer berikelser

Analyser:

- helse
- reproduksjon (antall egg)
- og klekking suksess
- adferd i open field (ny miljø)
- vekt/lengde
- kortisol
- hjerne monoaminer





Evgenia Dunaevskaya
PhD student

Supervisors team



Eirill Ager-Wick, PhD, head of fish unit
Marco A. Vindas, associate professor



Ian Mayer, professor
Romain Fontain, PhD, head of salmon unit

Technician team



Arturas Kavaliauskis, head of model fish unit
Anthony Peltier, ingenier

➤ <https://fish-vet.no/>



Dyrevernalliansen

Stiftelsen Astri og Birger Torsted legater