



Vitenskapelig og uvitenskapelig merking av fisk

FHF-workshop om merking og sporing 19-20/11 2013

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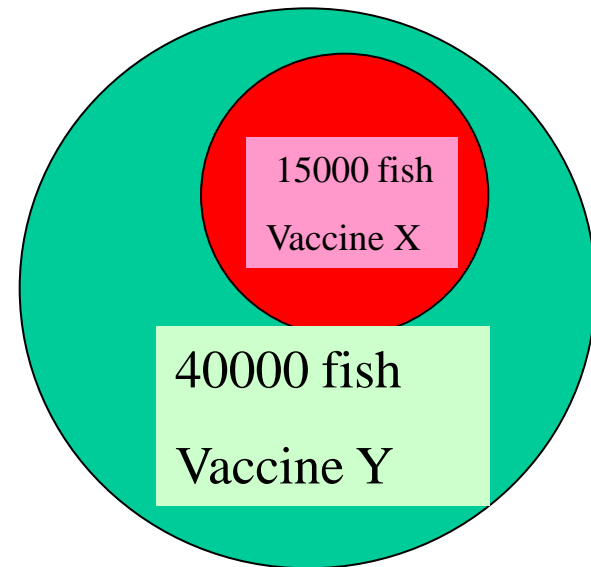
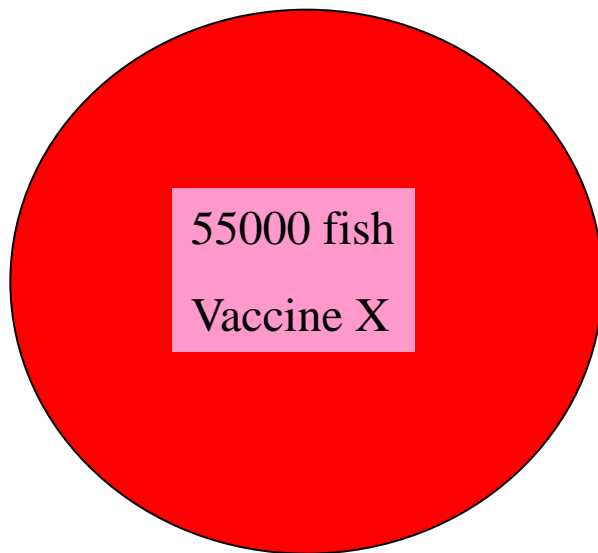
Episenteret, Norges veterinærhøgskole

Population effects (herd effects)

- Fisk eksponeres for mange forsøksfaktorer på gruppenivå
 - Vannmiljø
 - Fôring
 - Sykdom/smitte
 - osv.
- Forårsaker ukjent og til dels stor variasjon mellom kar/merder
- Løsning:
 - Mange parallelle kar/mærer
 - Holde merket fisk i samme kar/mær

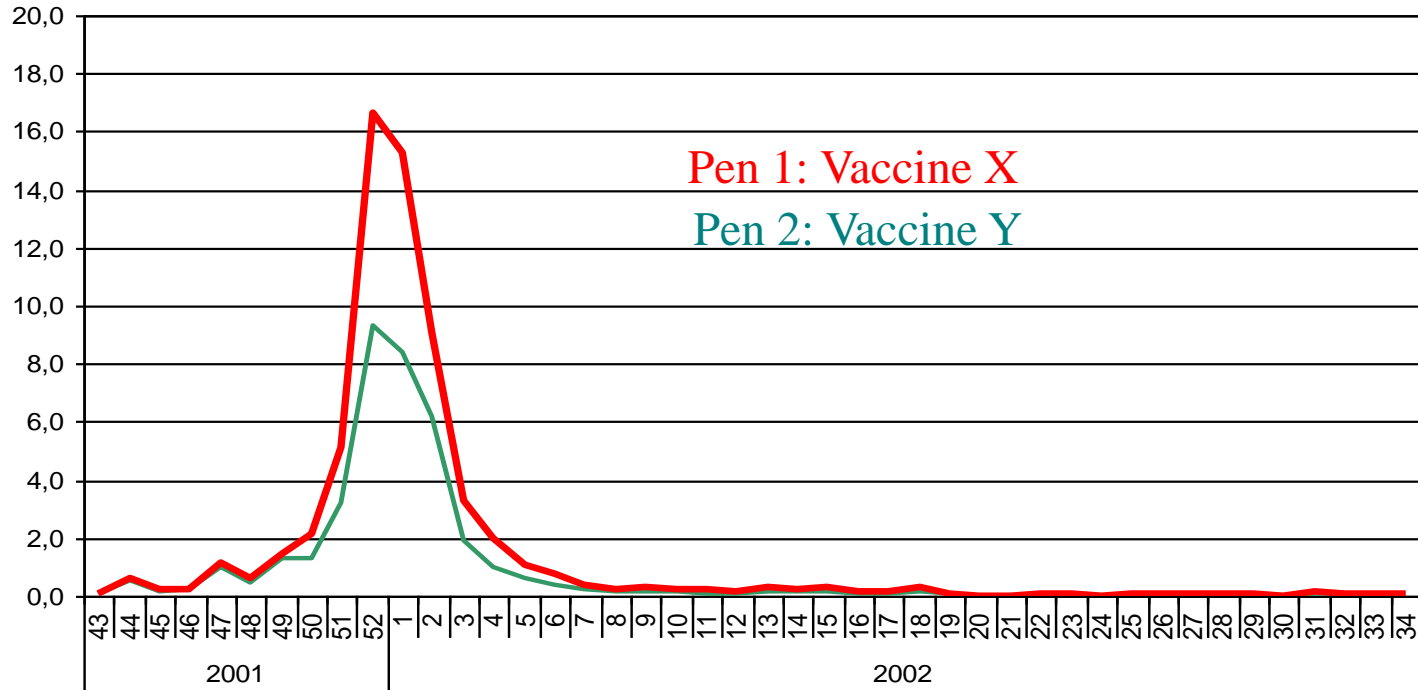


Conventional vs alternative trial design



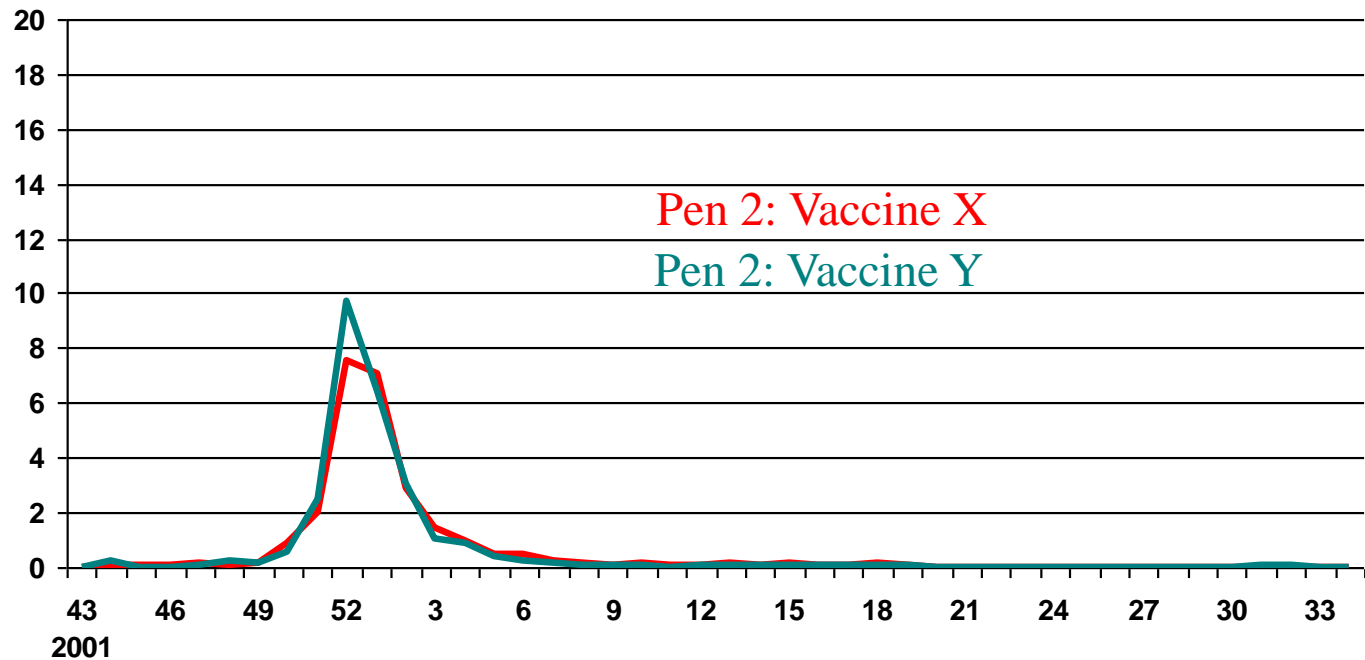
Marked vaccine X group mixed with vaccine Y
in pen 2

Weekly mortality



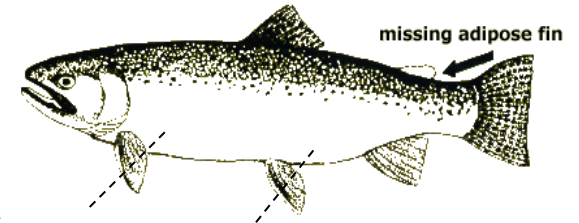


Weekly mortality



Group identification markings

- Fin clip/
- Maxilla clip



- Alcian blue "tattoo"



- Floy tags



- Coded (metal) Wire Tags
- Colour coded elastomers

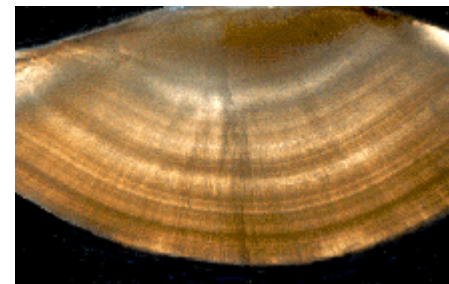


Group identification markings

- Fluorescent chemical marking of scales

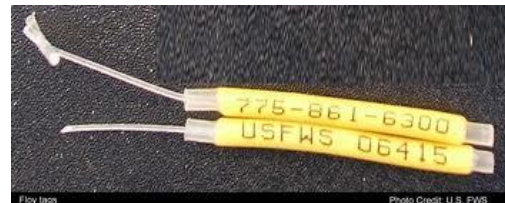
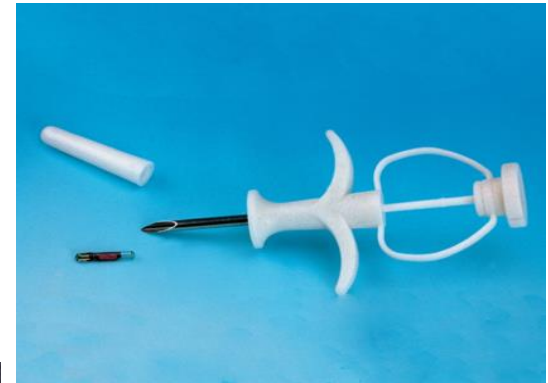


- Chemical marking of otoliths



Individual identification markings

- Subcutaneous numerical implant tags
- Coded (metal) Wire Tags
- PIT tags
 - size like dog and cat tags
 - inert
 - mini-PIT tags (mouse tags) are available
- Floy tags



Floy tags

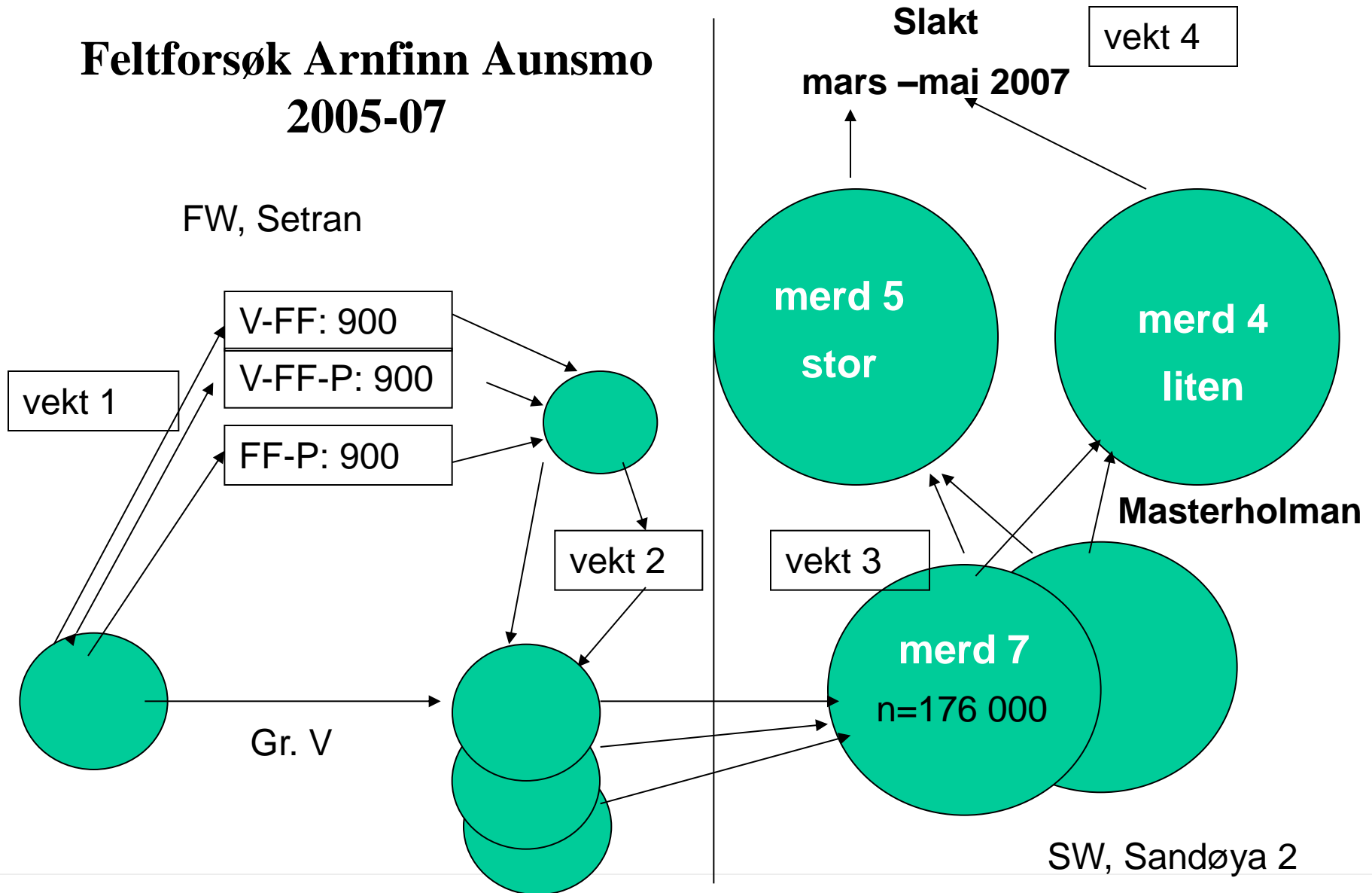
Photo Credit: U.S. FWS



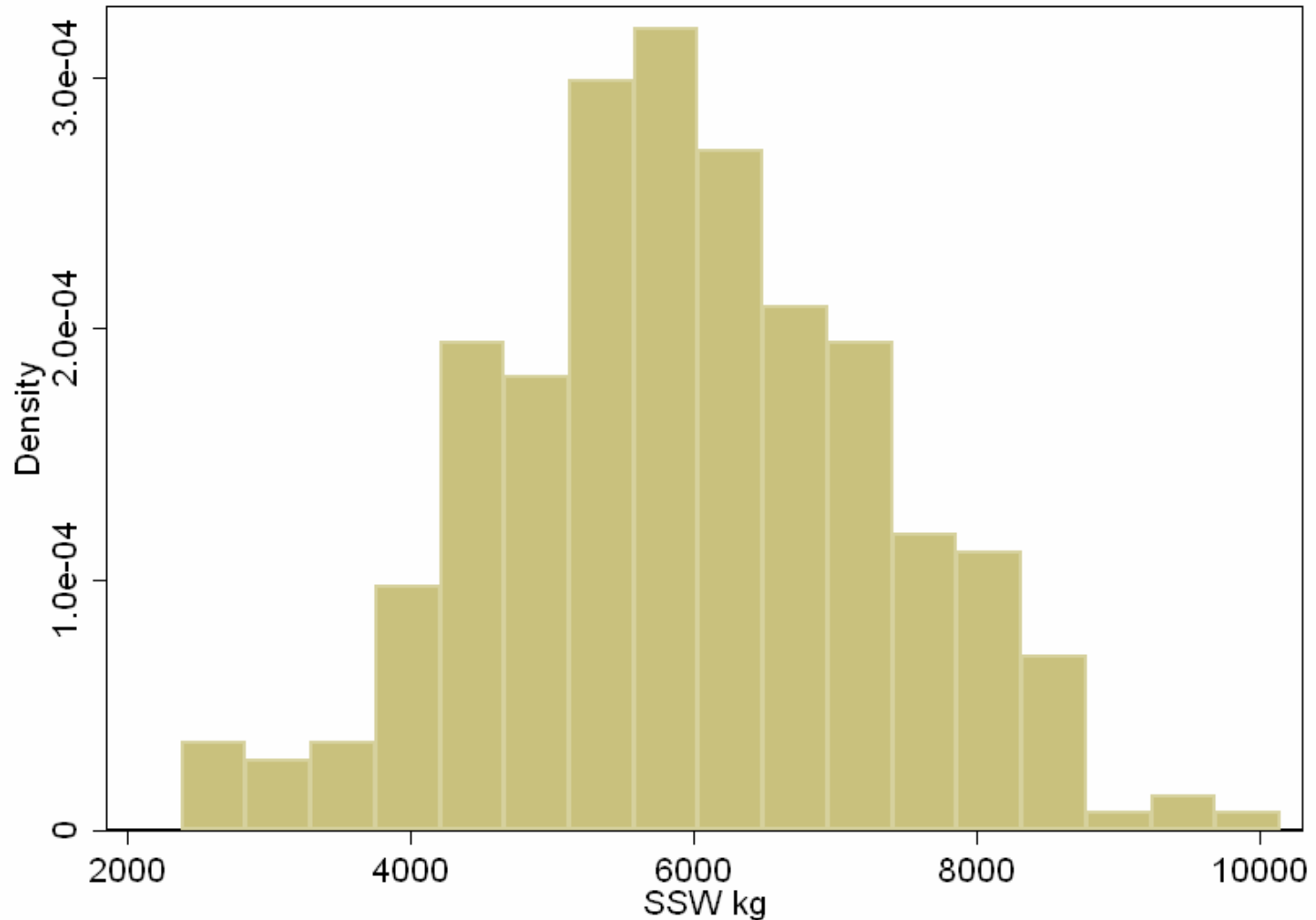
Fordeler ved individmerking

- Gjentatte målinger på samme utvalg fra populasjonen
 - unngår sampling bias, avdekker «sann» individ-til-individ variasjon,
- Tillater å tilordne *in vivo* observasjoner til avlesninger som bare kan gjøres etter avliving
 - kjønn, patologi, infeksjonsstatus, osv.
- Muliggjør minimalisering av antall fisk hvis studien krever svært belastende prosedyrer (men nok til å få statistisk gyldig resultat)

Feltforsøk Arnfinn Aunsmo 2005-07



Variasjon i SSV (standardisert slaktevekt)





Variabler assosiert med SSV

(n=314 PIT-merkede individer)

Variabel	Koeffisient (β) (gram)	95% KI for β	P
Vaksinert	-506	-768, -243	<0.001
Kjønn (hann)	1211	950, 1473	<0.001
Vekt ved vaks	36.2	11.1, 61.2	0.005
Ryggdeform	-1177	-1889, -465	0.001
Intercept	3793	2519, 5066	<0.001



Modellforklaring

- Adjusted $r^2 = 0.26$
 - 26% av variasjonen i SSV er forklart av modellen
 - kjønn forklarer alene 20% !!
 - Sex is far more important than drugs in the salmon industry!

What is a «procedure»

Council of Europe Resolution on ETS123 1992:

"The Parties to the Convention consider the amount of pain, suffering or distress caused by the introduction of a needle into the body of an animal as illustrating the level at which the use of an animal becomes a "**procedure**".





Definition of ”procedures”

ETC no 123, Art. 1.2.c:

- “procedure” means any experimental or other scientific use of an animal **which may cause it pain, suffering, distress or lasting harm**, including any course of action intended to, or liable to, result in the birth of an animal in any such conditions, but
- **excluding the least painful methods accepted in modern practice (that is “humane” methods) of killing or marking an animal.**



Marking of animals in science and non-science

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

(Text with EEA relevance)

.....

Art. 5. This Directive shall not apply to the following:

.....

- (d) practices undertaken for the purposes of recognised animal husbandry;
- (e) practices undertaken for the primary purpose of identification of an animal;

.....

Revidert norsk forsøksdyrforskrift

- Mattilsynet foreslår at unntaket for identitetsmerking i den reviderte norske forskriften skal innsnevres i forhold til EU-direktivet:

EU-direktivet	Nytt forskriftsforslag
“practices undertaken for the primary purpose of identification of an animal”	«enkel identitetsmerking»

- Mattilsynet vil kreve søknad og tillatelse for enhver vitenskapelig feltstudie, selv om nøyaktig samme inngrep ovenfor dyra pålegges av dem selv som ledd i sykdomsovervåkning og -kontroll (eksempler: blodprøvetaking, lusetelling).

«Double standards»: hva blir konsekvensene for feltstudier i norsk havbruk?

Animal welfare is about how the animals perceive their own state, not how it happens to be perceived by us (Bracke et al 1999).

Animal welfare evaluation of marking methods

- Pain – intensity and duration, analgesia
- Degree of emotional distress during netting (sedation/anaesthesia) and marking procedure
- Need for longer and deeper anaesthesia during marking =higher mortality risk
- Wound healing: the lower water temperature, the more in disfavour of (freeze) branding, scarification etc.
- Degree and duration of negative functional effects

Agreement on the «least painful («humane») marking methods as defined by the Council of Europe Treaty is needed!