

Husbandry & Risk management

Optimizing value out of mussel culture



Husbandry is not growing mussels- it's managing

It's an artform of interplay to manage the production equipment, technical operations, logistics and personnel within the biological and physical conditions on your site, so that your mussels not only survive, but can reach market size with high quality meat at a value that will make your business profitable.

Management interplay

- Type of infrastructure (lines, tubes) impacts on how you produce mussels
- Production equipment & access impact on efficiency/ability of execution
- Bio-physical conditions impact your time to market & operating schedule
- Production method (sock, harvest) impacts your independence & control
- Your knowledge of mussel behavior, yield & growth impact decision ability



- What your mussels are doing below is your business!

Moving offshore requires that we Produce more efficiently with less!

A) Preparing for offshore & harsh conditions

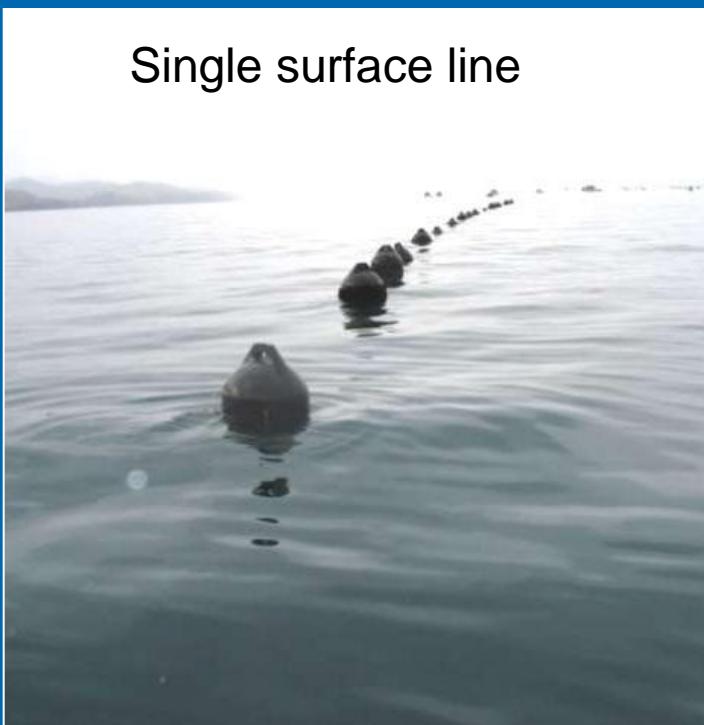
- 1) Infrastructure
- 2) Boats & equipment
- 3) Anchoring

B) Practical examples that impact on yield/value

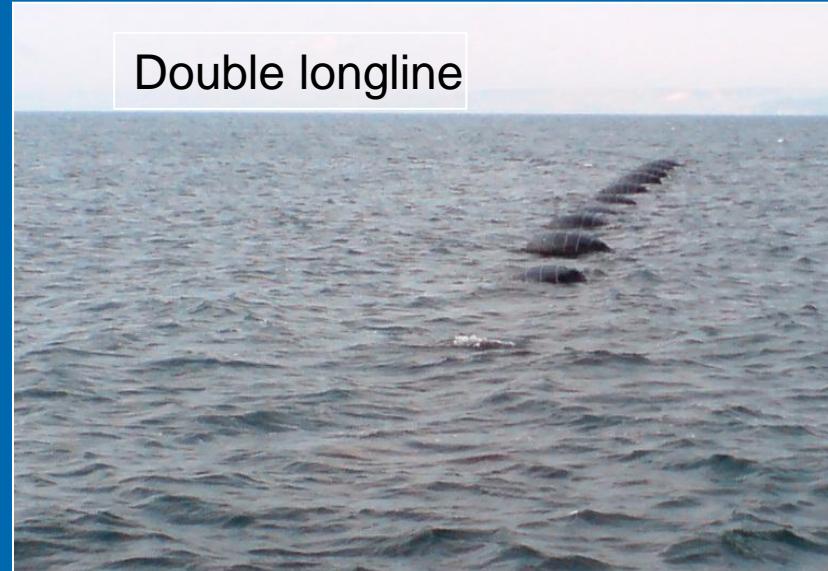
- 1) Adapted floatation
- 2) Managing invasives
- 3) Quality socking
- 4) Duck predation

1) Infrastructure: the critical starting point!

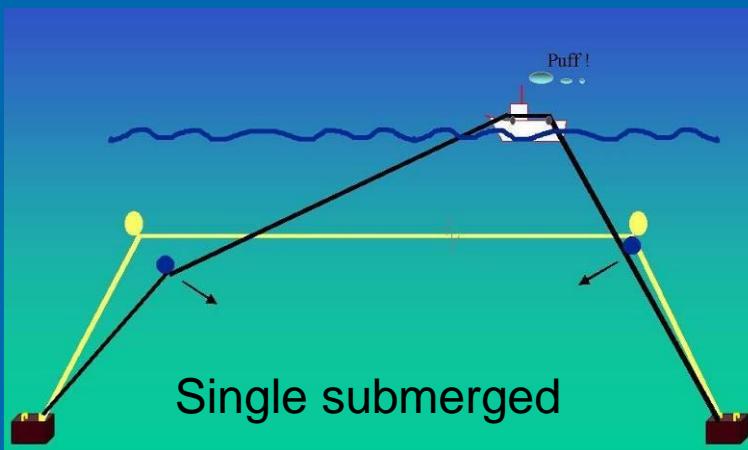
Single surface line



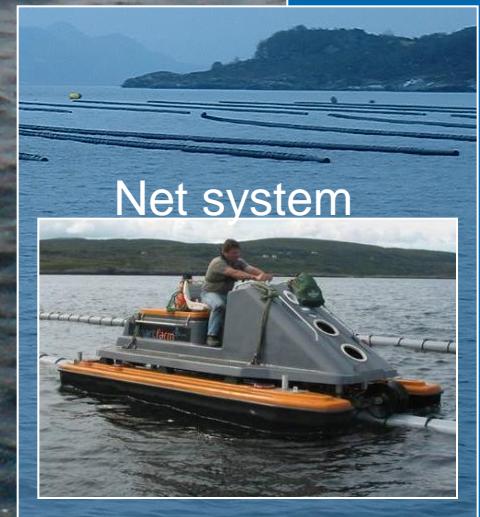
Double longline



Single submerged



Net system



**Infrastructure: impacts production method!
(how you manage & grow mussels)**

2) Size of boats or raft impacts efficiency



2) Work space & equipment impact ability of execution



2) Hoisting power/ quality ropes: meet offshore needs



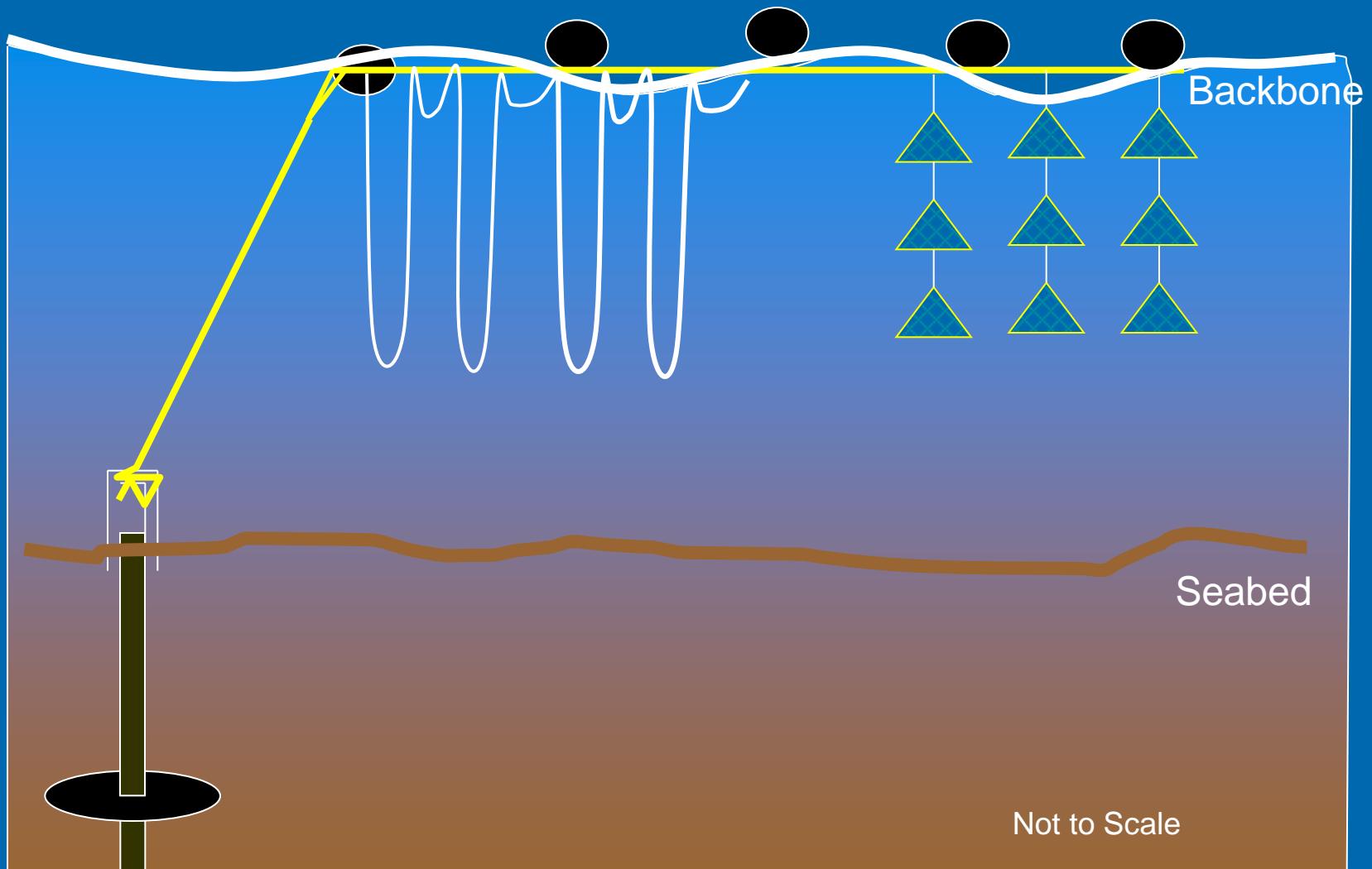
Bio-Physical conditions impact on equipment selection, risk and logistic execution

3) Anchoring & logistic installation impact on risk



Installation may require large initial resources

3) Screw Anchor System depends on bottom type



B) Practical examples that impact on yield/value

- 1) Adapted floatation
- 2) Managing invasives
- 3) Quality socking
- 4) Duck predation

Right choice shown to increase production yields without increasing farm size!

Some detailed examples from Results

1) Adapted floatation is cost-effective

Killary Harbour
- Galway



Roaring water
- Cork



1) Right floatation technologies can increase profits, decrease costs!



Should use the right floats to hold mussels, get maximum yields and value!

1- Comparing JFC and thin-walled floats

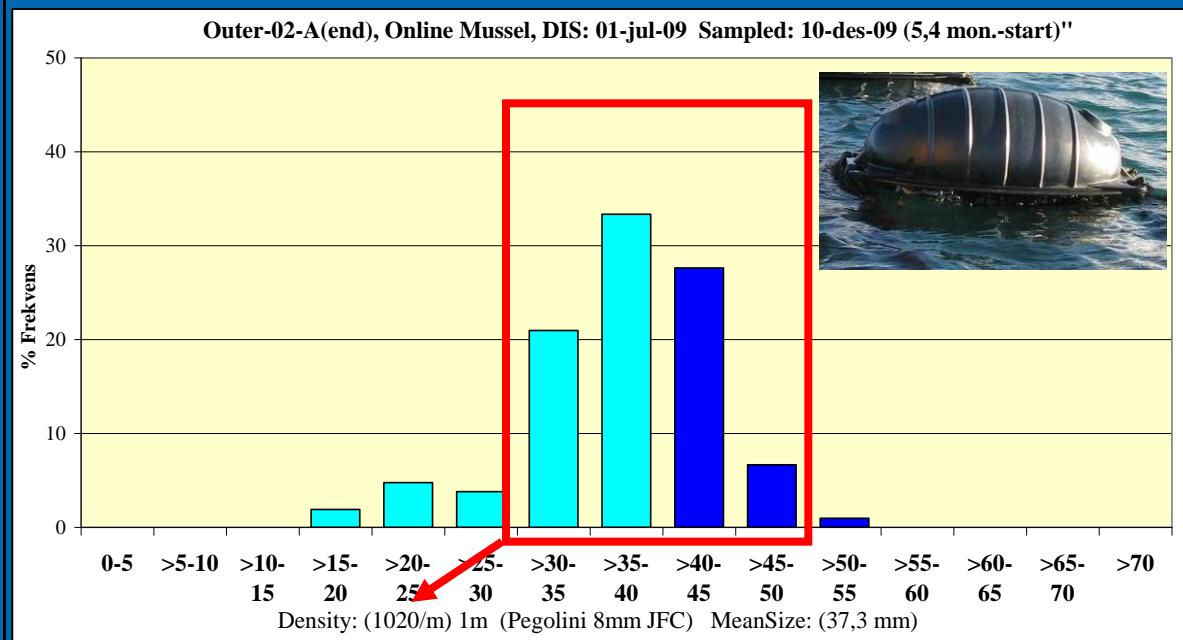
Do costlier JFC floats really increase commercial value growers?

Measured

- size distribution
- density
- commercial biomass (yield)
- fall-off
- time to market



1-Typical biomass differences with JFC-ribbed vs barrel floats



- Larger mean size
- Higher densities
- Stable densities
- Faster growth
- Less fall-off
- yields 10-30% > / JFC line

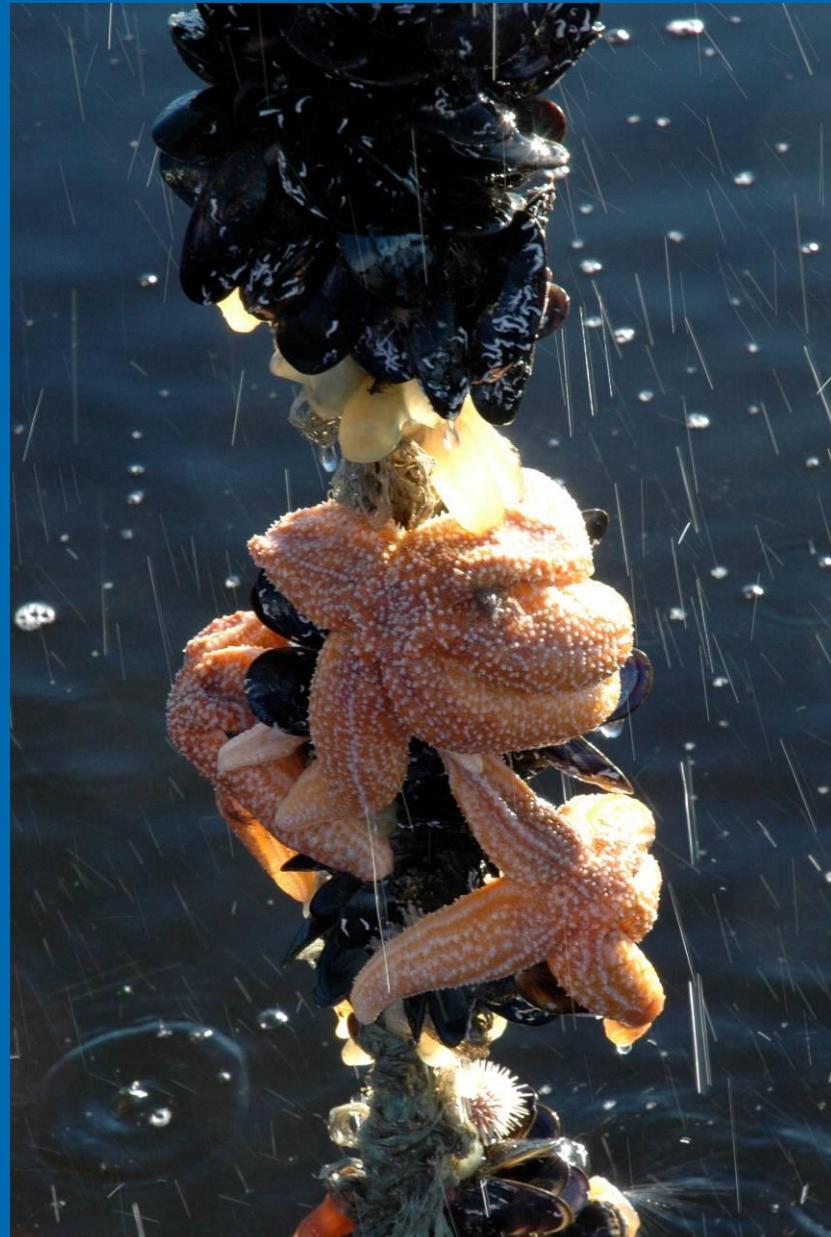


2) Fouling and Managing invasives

- Sea squirts and starfish can wipe out a site



Invasive fouling: 2nd set spat/ starfish/...?



2) Risk management– war on sea squirts & starfish - one line at a time!



2-Results from spraying formic acid

- Clean mussels
- No fouling
- High quality
- Maintain 5+kg/m yields



Ex: Swedish producer takes action fast after consultation-sep'12



3) Socking right produces mussel lines with high commercial biomass



Even with depth, consistent yields
Better planning ability
Quality shells, efficient harvesting

Avoid Mishaps



Winter storm + floatation



Wrong timing for socking



Wrong densities

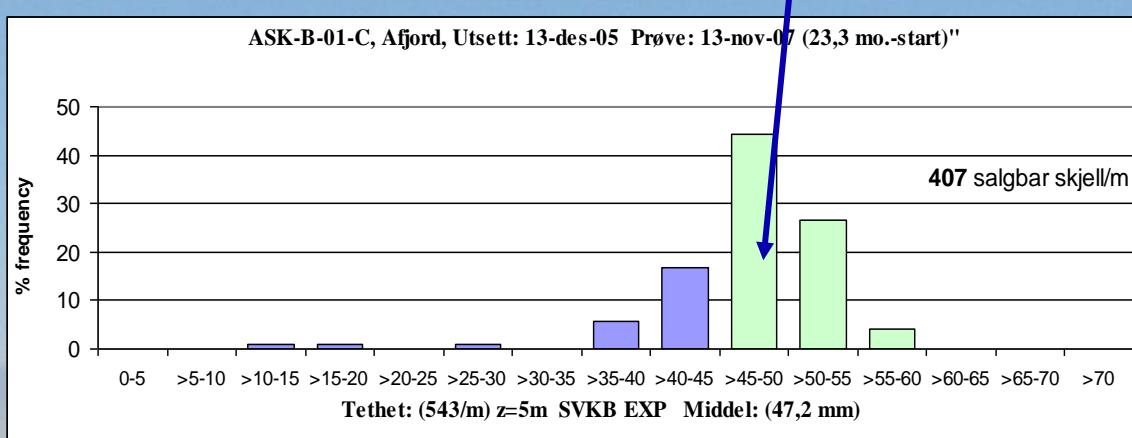
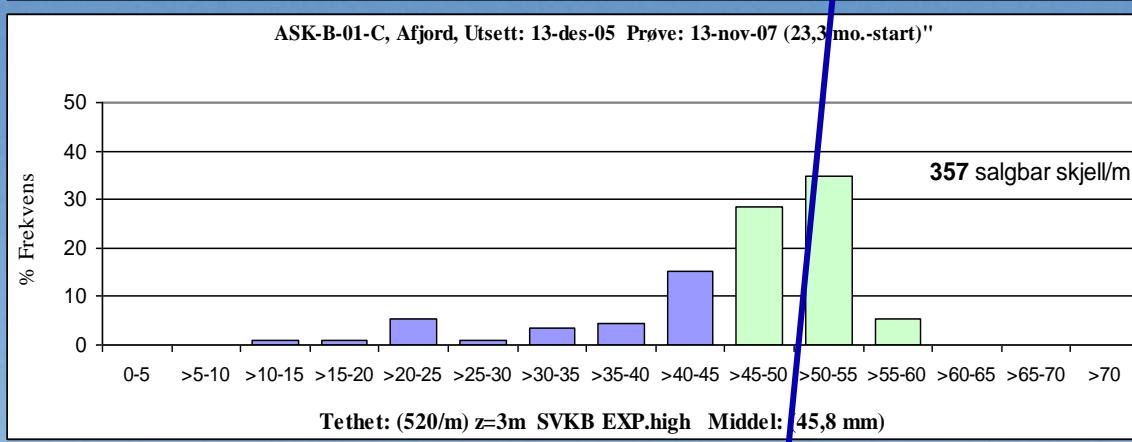
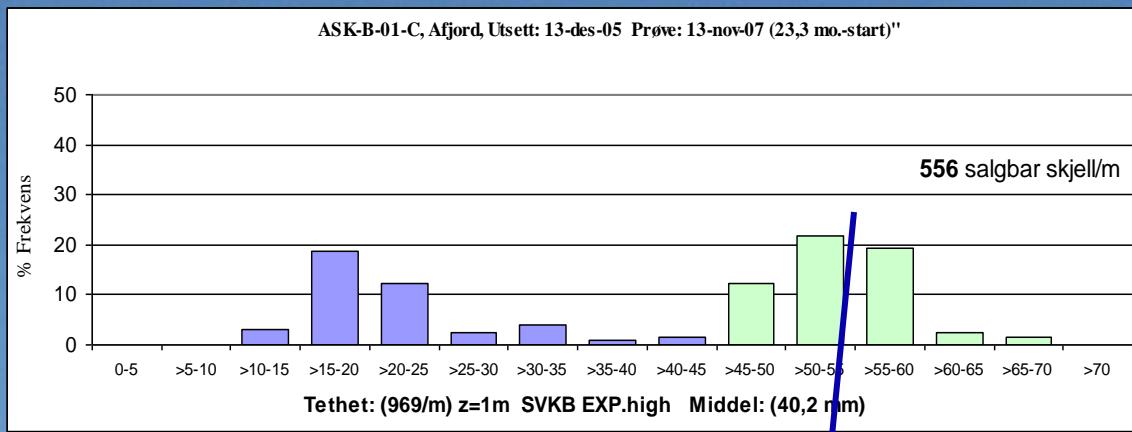
4) Managing offshore eider duck predation



Husbandry

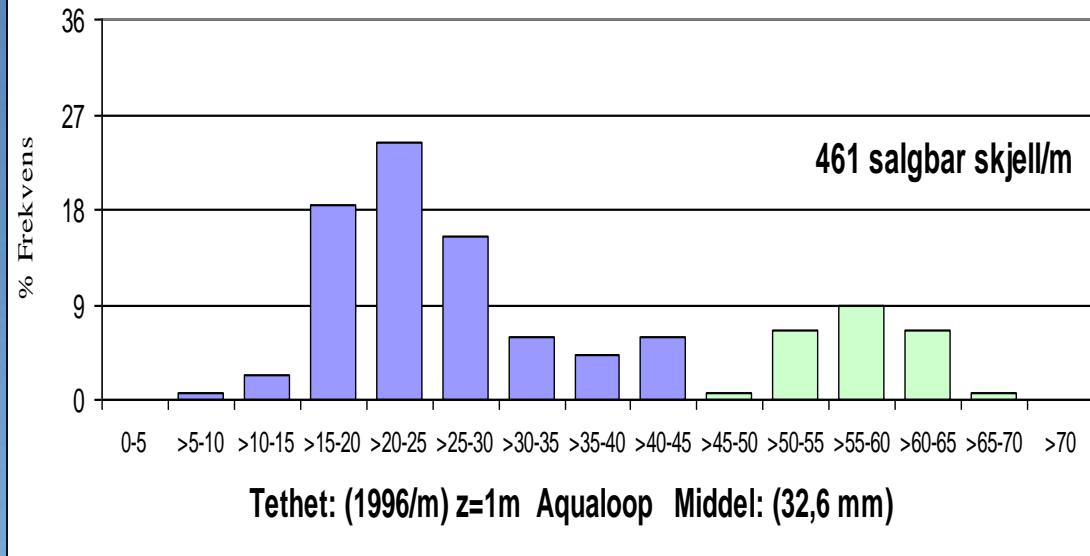
c) Practical examples that explain differences in yield & size

Sampling at different depth- know what you have!

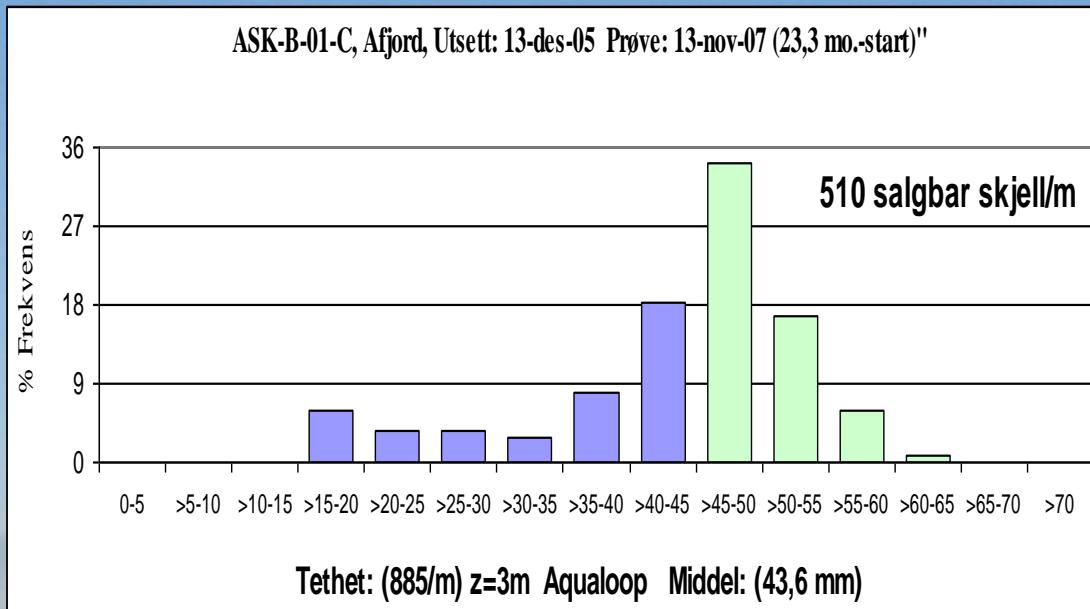


Same line @ diff depth: story?

ASK-B-01-C, A fjord, Utsett: 13-des-05 Prøve: 13-nov-07 (23,3 mo.-start)"



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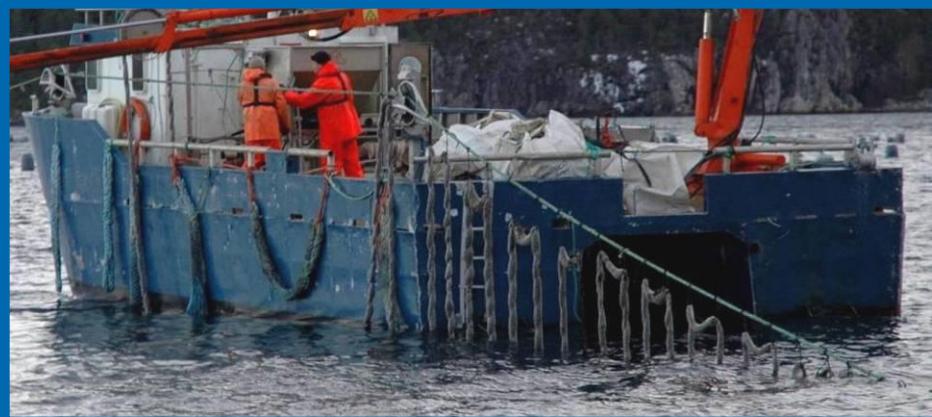


Sampling your offshore sites is key: Know when/why mussels give higher value & select quality

- Timing for best declumping-grading of spat
- Sock narrow size range
- Use proper sock rope

Get:

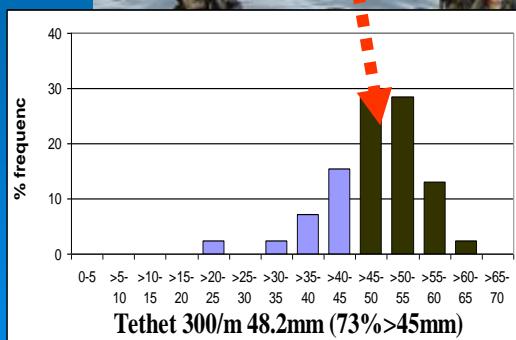
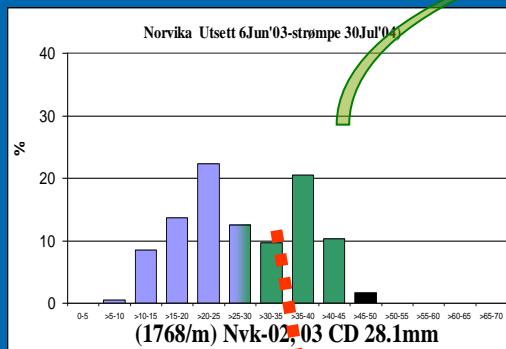
- High % commercial yields
- Better control of fouling
- Cost-effective harvest
- Better risk management



Automatic socking allows for rapid response: can import spat, limit fouling
Respond to 2nd set, extend socking season
Access to greater depth for grow-out
Vary density- *using all same material*

Socking increases yield and volume

Growth on collector only

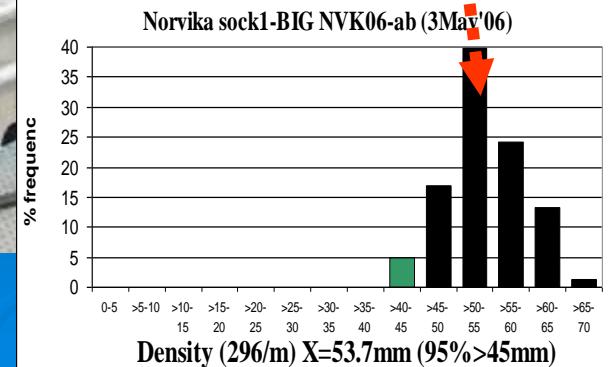
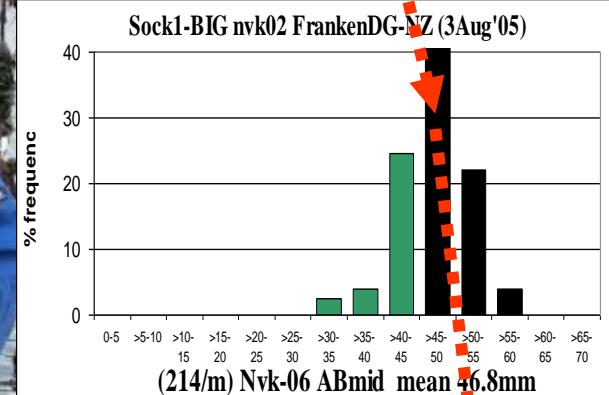
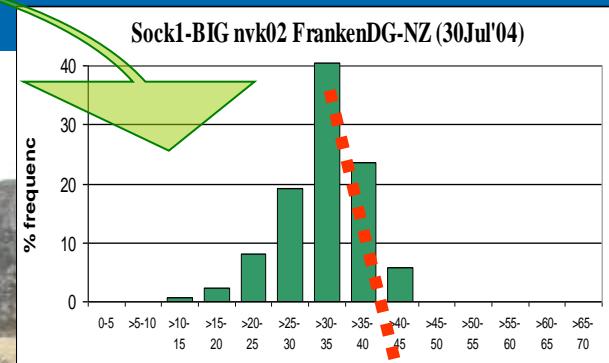


73% market

1m collector = 3.8kg

<<< after 30 mo >>>

Socking of largest mussels



95%

1m = 3.9 *2m = 7.8kg

Status: Mussel quality

Issues affecting expansion of market quality mussels

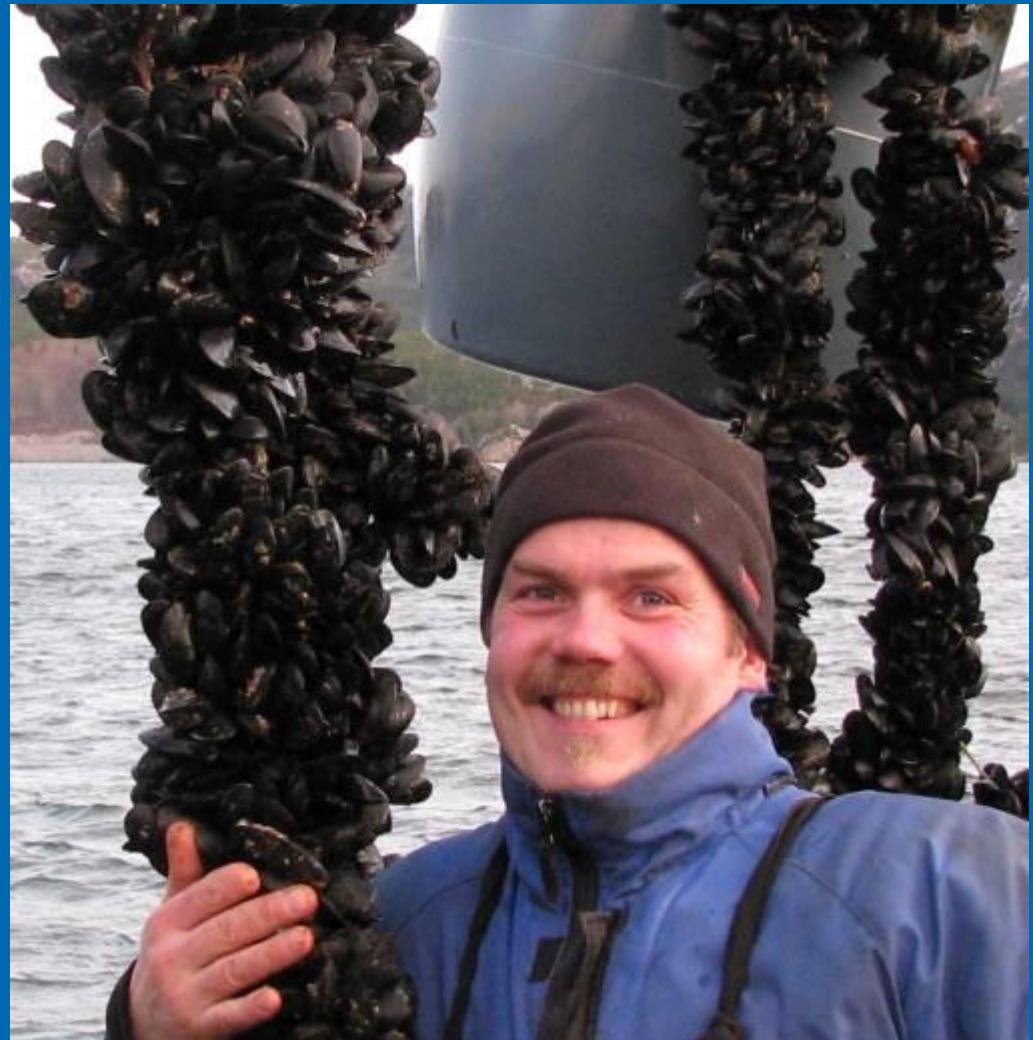
- 1) Poor harvesting machines damage shell quality & break largest shells
- 2) Wild 'collector' mussels -too much fouling on shells by Tubeworms, tear packaging, compared to socked mussels from other countries/areas
- 3) Variation in quality as mussels get older. This needs to be managed for different seasons.



Making good management decisions: about comparing the right information to get best results

Moving offshore is about:

- a) creating a common understanding of what is important
- b) Selecting the most effective technologies for this exposed environment
- c) Structuring a framework for a phased-in offshore development plan



Thank you

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Professional networks- please join
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