Live sea urchins; holding and transport and export

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FHF Live seafood workshop, Feb 2014
Live seafood chain for urchins

- Transport to land
- Capture
- Live holding
- HUB
- Processing
- Air transport
- Live holding
- HUB
- Road transport
- Market
Sea urchins: ideal for live transport
Sea urchin industry in Norway

Green Sea Urchin
(Strongylocentrotus droebachiensis)
Sea urchin industry in Norway

The urchin man

"Norwegian Green" sea urchins, found off the coast of Arctic Norway, are considered by many to be the finest on Earth. Yet the locals weren't interested until "Mad Bud" started diving for them 30 years ago.

Green Sea Urchin
(Strongylocentrotus droebachiensis)
Sea urchin research in Norway

• Innovation Norway

• FHF; ROV, passive trapping, Live seafood project

Cost effective and reliable methods of capturing sea urchin for developing the sea urchin industry in Norway
Processing sea urchins

ScanAqua

Tsukiji market
European live sea urchin markets

(Sardinia, Italy)

(Grüne Woche, Berlin)
Sea urchin holding and transport research

Holding conditions:
• Effects of varying water quality (nitrite, nitrate, CO₂, oxygen, temperature)
• Stocking density
• Feeding regimes

Transport:
• Troms Krakebolle AS (e.g. effects of chilling/wind)

Virtually no research:
• Transport between HUB’s (road transport)
• Landing urchins in arctic conditions
• Length of transport/quality on arrival/packing temperatures

<table>
<thead>
<tr>
<th>Parametre</th>
<th>Optimale</th>
<th>Normale</th>
<th>Kritiske</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanntemperatur °C</td>
<td>4.0 – 12.0</td>
<td>1.5 – 16.0</td>
<td>&lt; 1.5 &gt; 16.0</td>
</tr>
<tr>
<td>Salinitet ‰</td>
<td>30 - 35</td>
<td>34</td>
<td>Ukjent</td>
</tr>
<tr>
<td>Oksygenmetning %</td>
<td>&gt; 80</td>
<td>&gt; 80</td>
<td>Ukjent</td>
</tr>
<tr>
<td>pH</td>
<td>7.8 – 8.2</td>
<td>7.8 – 8.2</td>
<td>Ukjent</td>
</tr>
<tr>
<td>Total ammoniakk mg/l</td>
<td>&lt; 0.2</td>
<td>&lt; 0.2</td>
<td></td>
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</tbody>
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The challenges:

• Legislation (Norwegian Food Health Authority) categorised as a shellfish (EU standards) (Northern Periphery project, efforts by Arctic Caviar)
• Urchin supply (particularly in the far north)
• Transfer of urchins by road
• Packing and transport technology for export
• Quality control at market
• Measuring stress in urchins (ceolomic fluid)
• Optimising marketing strategies (supply at maximum value)

• FUNDING of research?