Occupational Health in Seafood Processing: Risks and Resources
This presentation synthesizes slides and material from presentations by George Fox (Carboner meeting), Kim Dunphy, Brenda Greenslade, Barbara Neis, Linda Sagmeister, Shirley Solberg and Ugis Bickis to the Finding Solutions Workshop, Battle Harbour Labrador, July 2006.
Health Risks Associated with Shellfish Processing
Health Risks

Shellfish processing is associated with many health risks including:

- Work-related Musculoskeletal Disorders (WMSDs)
- Occupational Asthma and Allergy (OAA)
- Envenomation
- Slips and Falls
- Dermatitis
- Ammonia leaks and cleaning chemicals
- Cold exposure
This presentation will focus on two major health risks:

- Work-related Musculoskeletal Disorders (WMSDs)
- Work-related Respiratory Problems (Occupational asthma and allergy)
Health Risks

Work-Related Musculoskeletal Disorders (WMSDs)
WMSDs

- Also called Musculo-skeletal Injuries (MSIs) and Soft Tissue Injuries (STIs)
- Include Repetitive Strain Injuries (RSIs) and Cumulative Trauma Disorders (CTDs)
- Injuries to soft tissue like muscles, nerves, tendons and ligaments anywhere in the body
- Can be caused gradually through awkward posture, repetitive motions, carrying, bending, twisting, working in hot or cold environments, and poorly designed workstation or tools
- Can also be caused by slips, trips, or falls
About half of all WHSCC claims in fish processing between 1999 and 2005 were for Soft Tissue Injuries.

Symptoms range from aches, pains and numbness to swelling, muscle weakness and fatigue.

Include problems like carpal tunnel syndrome, bursitis, tendonitis.

Can often be easily prevented by simple measures such as stretching, job rotation, risk assessments, etc.
WHSCC Claims for Soft Tissue Injuries

<table>
<thead>
<tr>
<th>Year</th>
<th>Bodily reaction</th>
<th>Overexertion</th>
<th>Repetitive motion</th>
<th>Total Soft Tissue Lost Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td></td>
<td>375</td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
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<td>300</td>
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<tr>
<td>2001</td>
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<td></td>
<td></td>
<td>225</td>
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<tr>
<td>2002</td>
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<td>150</td>
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<tr>
<td>2003</td>
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<td>100</td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
<td>75</td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
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</tbody>
</table>

**Note:** The data shows a decrease in the number of claims for each category from 1999 to 2005.
In a recent single-plant study, 89% of surveyed female plant workers and 82% of male workers had symptoms of WMSDs. Close to half of these workers reported symptoms continued beyond the work season. Most had gone to a local physician; a few had been referred to a specialist. Many workers self-managed symptoms through pain medication.
Work-related Respiratory Problems: Occupational Asthma and Allergy (OAA)
Asthma: health condition that causes air passages to become smaller leading to shortness of breath, wheezing, cough and chest tightness.

Occupational asthma is caused and/or aggravated in the workplace by fumes, allergens, dusts and chemicals.

Symptoms usually improve or disappear away from workplace.
Exposure to aerosolized proteins from crab and shrimp is a major cause of OAA in plant workers.

As shellfish is processed, proteins are released into the air and inhaled by workers who may then become sensitized to them.

In shellfish processing plants, there are also irritants such as sulphites, forklift fumes, and cleaners which can aggravate OAA.
Research on OAA has shown:

- a high prevalence of OAA among Eastern Canadian snow crab processing workers (up to 15%)
- processing “cooked” crab seems to be associated with a higher level of allergens than “raw” crab
- many workers don’t know that OAA can lead to serious health problems and that it is a compensable illness
- many health professionals feel they need more skills and better access to medical equipment to diagnose “crab asthma”
- women are more likely to get sick than men because of differences in exposures to allergens at work
Health Risks

Other Issues:

• Shellfish processing communities often have limited access to occupational health & safety expertise or appropriate medical care

• OAA and WMSDs can be difficult to diagnose

• There is under-reporting of illness for many reasons including few alternative employment opportunities and fear of job loss

• Workforce is aging and many communities are in decline

• Employment insecure within shellfish processing industry
Resources for Dealing with Work-Related Risks
Resources

Tools

• Ergonomics

• Occupational Health Risk Management

Services

• Workplace Health, Safety and Compensation Commission (WHSCC)

• Dept. of Government Services (OHS)
Resources: Tools

Ergonomics
Ergonomics deals with:

- **workstation design & layout**: items should be in immediate reach, height of work surfaces should be appropriate for employee.

- **state of equipment**: tools should be right size for employee and be appropriate for the task; equipment should be properly maintained.

Means fitting the task and the environment to the person to prevent discomfort and possible injury.
Ergonomics

- **Organization of tasks**: length of shift, variety of tasks, seasonability of job and amount of recovery time between tasks affect ergonomics.

- **Body mechanics**: employees should receive appropriate breaks, avoid awkward postures and use mechanical aids where possible.
• Ergonomics can improve productivity, quality of work and health and safety conditions

• Employers are required by law to ensure employees work in an ergonomically safe workplace

• Ergonomics must be included in workplace inspections
Ergonomics

It is important to:

• Prevent injury from occurring by looking for ergonomic risks
• Develop a system to report and address symptoms of injuries
• Report symptoms as early as possible

Department of Governments Services and WHSCC can provide this tool
Industrial / Occupational Hygiene: Reducing Exposures (e.g. Allergens, Chemicals)
Identifying and reducing work-related exposures to airborne contaminants, such as dust, shellfish proteins, mists

- Basic Principles: anticipate, recognize, control, communicate and evaluate
- Contaminants are managed at the source, along the path and at the receiver
- Proper ventilation is very important
Allergen levels vary between plants

Average allergen concentration [ng/m3] in four NL plants: “Area” and “Personal Breathing Zone” samples

- Average allergen concentration [ng/m3] in four NL plants: “Area” and “Personal Breathing Zone” samples

Allergen Concentration [ng/m3]:
- Plant 1
- Plant 2
- Plant 3
- Plant 4

Area Samples:
- Plant 1: ≥100 ng/m3
- Plant 2: ≥100 ng/m3

PBZ Samples:
- Plant 1: 0 ng/m3
- Plant 2: 0 ng/m3
- Plant 3: 0 ng/m3
- Plant 4: 0 ng/m3
Allergen Levels in Different Areas

Levels can be high in sawing, brushing, packing areas

- Allergen Concentration [ng/m³]
  - 0
  - 50
  - 100
  - 150
  - 200
  - 250
  - 300
  - 350

- Plant 1
- Plant 2
- Plant 3
- Plant 4

≥100 ng/m³

- Outside
- Butcher
- Cooker
- Freezer
- Packer
- Sawing
- Brushing

Location
LEV – Local Exhaust Ventilation

- Minimize aerosolization of contaminants (allergens, etc.)
- Capture / collect contaminants that are in the air as close to source as possible
- Exhaust contaminants away from workers
- Avoid return of contaminants in make-up or replacement air
- Make-up air should be:
  - clean
  - directed to occupied zone
  - should move through zones of increasing contamination to exhaust
Maximize capture at source

Watch out for things that can interfere with effective capture

<table>
<thead>
<tr>
<th>TABLE 5-1 COMPETITORS TO CAPTURE VELOCITY</th>
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</thead>
<tbody>
<tr>
<td>- Cooling fans, free standing fans</td>
</tr>
<tr>
<td>- Make-up and general room-air ventilation system outlets</td>
</tr>
<tr>
<td>- Wind blowing through open windows and doors</td>
</tr>
<tr>
<td>- People walking by (a person walks about 300 fpm)</td>
</tr>
<tr>
<td>- Mobile equipment passing by</td>
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<tr>
<td>- Obstructions in the path of capture which create eddying, turbulence</td>
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</tbody>
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<table>
<thead>
<tr>
<th>FIGURE 5-8. COMPETITORS TO CAPTURE</th>
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<tbody>
<tr>
<td>2006/07/11</td>
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<tr>
<td>Burton, NE 1990</td>
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</table>
Ways to improve capture at source

Side baffles can improve efficiency
Avoid Re-entrainment

Get contaminants out and keep them out!
Resources: Services

Workplace Health, Safety and Compensation Commission (WHSCC)
WHSCC

- Established in 1951
- Governed by board of directors appointed by provincial government
- Employer funded
- Administered by an independent party
- Provides mandatory coverage to 97% of NL’s workforce
WHSCC provides three main services:

- conducting assessments
- managing claims
- encouraging injury & illness prevention
WHSCC: Assessments

• All employers must register with WHSCC

• WHSCC collects revenue from employers in form of assessments

• Employers pay a premium based on certain criteria
WHSCC: Process of Managing Claims

- Injury or illness occurs
- Employee and employer submit claims
- Doctor submits medical documentation
- WHSCC reviews documents
- Adjudicator makes decision on compensation (benefits can include medical aid, temporary earnings loss, extended earnings loss, pension replacement benefits, survivors benefits, etc)
- Possible appeal
- Early & Safe Return to Work or Labour Market Re-Entry
WHSCC: Prevention Services

• WHSCC promotes a culture of health & safety and primary prevention of illness and injury

• Encourages leadership within management, OHS committees and employees to work on OHS issues

• WHSCC is required by law to develop OHS standards, and approve and monitor certification training
Department of Government Services
Government Services

• Provide inspections to determine compliance with minimum health and safety standards

• Do spot checks

• Can give orders, stop work orders or prosecute if necessary

• Are not responsible for enacting safety measures or telling employers how to fix problems
Government Services

• Role in SafetyNet project is to support research
• Still have a lot to learn about occupational health issues in shellfish processing
• Have a lot of resources available to employees and employers
Website Resources

• SafetyNet  www.safetynet.mun.ca
• NL Lung Association www.nf.lung.ca
• Eastern Canada OHS www.shellfishohs.ca
• WHSCC  www.whscc.nf.ca
• Government Services www.gs.gov.nl.ca
• American Conference of Governmental Industrial Hygienists: Ventilation Manual
  www.acgih.org/store/ProductDetail.cfm?id=1668
Website Resources

• Canadian Registration Board of Occupational Hygienists
  www.crboh.ca

• Association of Canadian Ergonomists
  www.ace-ergocanada.ca

• Health Canada: Health Impact Assessment

• International Occupational Hygiene Association
  www.ioha.net

• World Health Organization, OHS document