UNIVERSITY OF GOTHENBURG

THE WORK ENVIRONMENT IN SWEDEN FISH PROCESSING INDUSTRY AND AMONG FISHERMEN

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Aim

- To study the risk of asthma and work-related symptoms among fish processing workers and fishermen with questionnaires

- To characterize the exposure at one herring processing plant

Fish processing workers

- Work-related symptoms
  - Generally
  - Respiratory symptoms
  - Some other work-related symptoms

- Our study
  - Questionnaire
  - Measurements

Introduction

- Clinically seen among workers processing salmon and herring
  - Sensitized asthma
  - Asthma and respiratory symptoms
  - Flue-like symptoms
- Clinically seen among fishermen
  - Work-related asthma

STUDY POPULATIONS

- All licensed fishermen (LF) in Sweden
  - 1866 identified, 30 not localized
- Swedish fish processing workers (FPW) at 10 available plants
  - 918 workers identified, 2 not localized

    (15-423 workers/plant incl office)
  - FPWA – 2 plants with mostly filleting
  - FPWB – plants handling fish and seafood preparing food

Methods

- Long questionnaires
  - Work tasks and work conditions
  - Work-related symptoms
  - Asthma
  - Respiratory symptoms and diseases
  - Atopy, allergy
  - Smoking habits
- Short questionnaires

Work-related symptoms

12. At work, have you during the last 12 months experienced any of the following symptoms?

	Yes, daily/ each week	Yes, few times	No
Cough without phlegm	❒	❒	❒
Cough with phlegm	❒	❒	❒
Wheeze in your chest	❒	❒	❒
Dyspnea with wheezing	❒	❒	❒

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SUBJECTS

	Respone Rate LQ+SQ	*Long Quest LQ*	*Short Quest SQ*	*Not Office LQ*	*Last Year LQ*
FPW A	*63%*	*48*	*7*	*45*	*40*
FPW B	*46%*	*346*	*33*	*283*	*246*
LFishermen	*66%*	*1049*	*162*	*1049*	*932*
Referents	*64%*	*334*	*-*	*-*	*-*

Methods

- Cumalative prevalence
  compared to referents with chi-square test or Fisher's exact test
  - physician-diagnosed asthma
  - adult-onset physician-diagnosed asthma (onset after 15 years old)
  - adult wheeze (after 15 years old)
- Prevalence each week last year
  compared to fishermen with chi-square or Fisher's exact test
  - work-related symptoms and other items

Subjects, characteristics

	Atopy	*Current Smoker*	*Never smoker*	*Male*	*Mean age*
FPW A N=52	*21%*	*21%*	*44%*	*50%*	*43*
FPW B N=316	*28%*	*16%*	*53%*	*53%*	*43*
LFishermen N=1211	*20%*	*12%*	*52%*	*99%*	*52*
Referents N=334	*22%*	*11%*	*54%*	*53%*	*52*

Prevalence of asthma and wheeze

**p<0.05 compared to referents*	*FPW A*	*FPW B*	*LF*	*Ref*
N	*52*	*316*	*1211*	*334*
Asthma, diagnosed	***17.3%****	*7.0%*	*5.9%*	*6.0%*
Adult asthma, diag	***13.5%****	*2.5%*	*2.3%*	*4.2%*
Adult wheeze	***26.9%****	*15.2%*	*13.2%*	*13.8%*

Work-related symptoms last year

Symptoms daily/each week **p<0.05 FPW compared to LF*	*FPW A*	*FPW B*	*LF*
Cough without phlegm	***12.5%****	*4.5%*	*3.3%*
Cough with phlegm	***22.5%****	*3.7%*	*4.6%*
Wheeze in your chest	***10.0%****	*3.3%*	*2.6%*
Dyspnea with wheezing	*7.5%*	*1.6%*	*2.0%*
Dyspnea	*0*	*0.4%*	*0.9%*

Work-related symptoms last year

Symptoms daily/each week **p<0.05 FPW compared to LF*	*FPW A*	*FPW B*	*LF*
Chest tightness	*5.0%*	*1.2%*	*1.1%*
Nasal congestion	***17.5%****	*8.5%*	*7.1%*
Runny nose	***17.5%****	***10.2%****	*6.0%*
Irritated throat	***22.5%****	*1.6%*	*3.2%*
Irritated eyes	*7.5%*	*4.1%*	*4.1%*

Work-related symptoms last year

Symptoms daily/each week **p<0.05 FPW compared to LF*	*FPW A*	*FPW B*	*LF*
Itching, flushing skin >2 days	*0*	*2.4%*	*1.8%*
Headache	***20.0%****	***9.3%****	*4.8%*
Head feels heavy	***20.0%****	*7.7%*	*5.4%*
Flu-like symptoms	***42.5%****	***19.5%****	*10.9%*
Flu-like symptoms >5 times	***25.0%****	***11.0%****	*2.9%*

Change of work task, accidents

**p<0.05 FPW compared to LF*	*FPW A*	*FPW B*	*LF*
Change of work task due to respiratory symptoms	***10.0%****	***5.3%****	*2.6%*
Visit to a physician due to an accident at work	*20.0%*	*13.4%**	*22.5%*

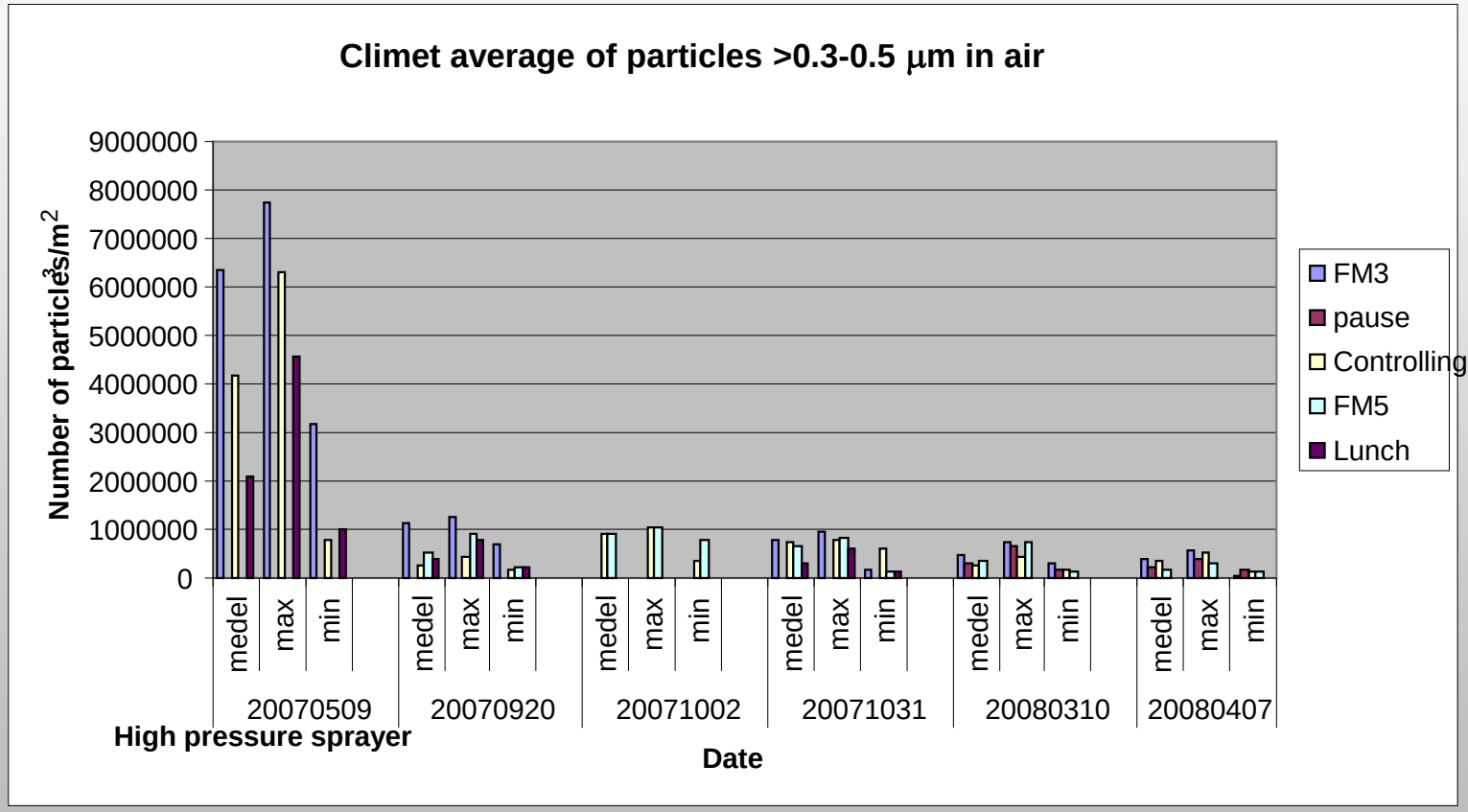
WHY MORE SYMPTOMS? EXPOSURES?

Measurements at filleting factory

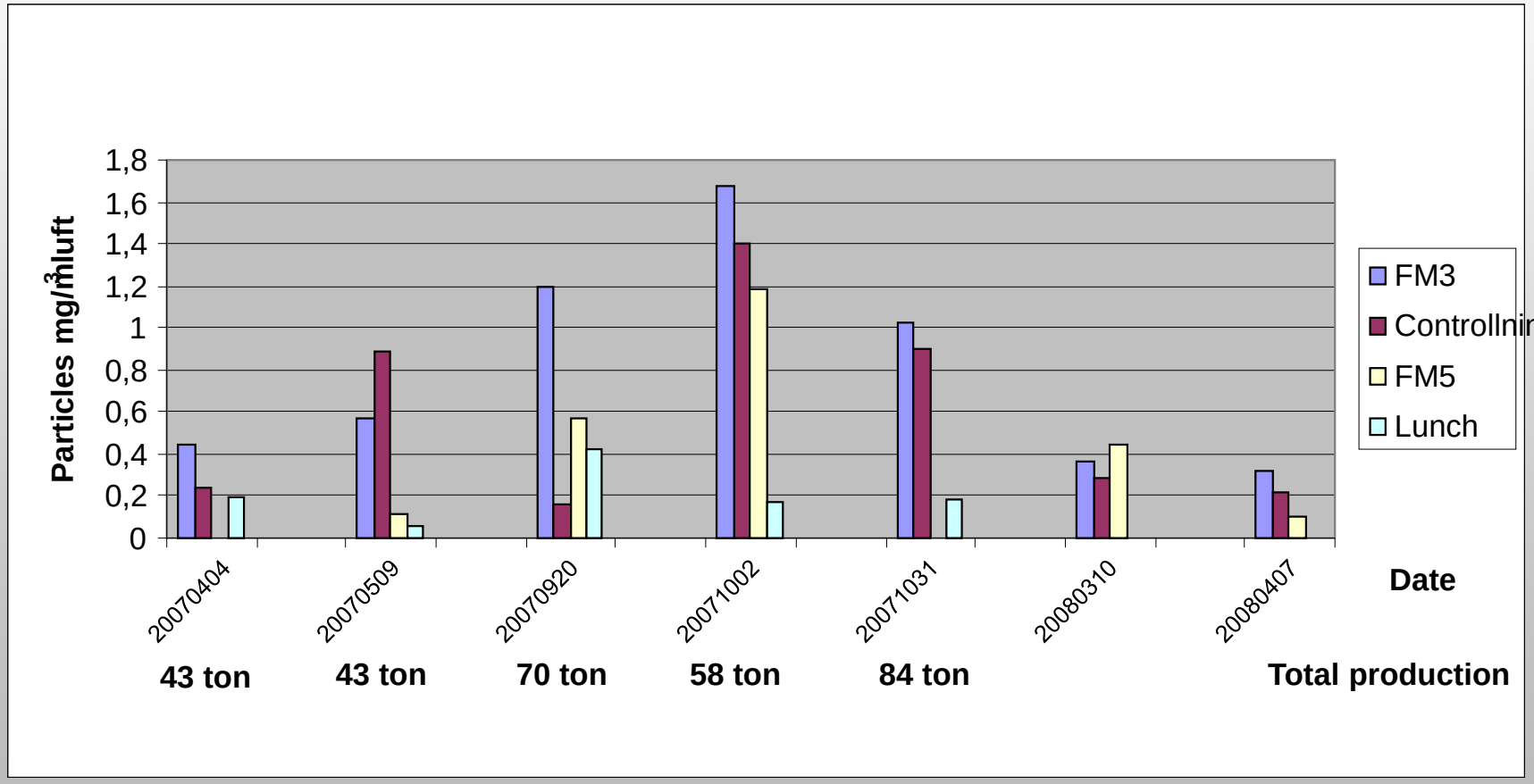
- Number/amount of particles in air
- Concentration of airborne herring antigen
- Concentration of endotoxins in air

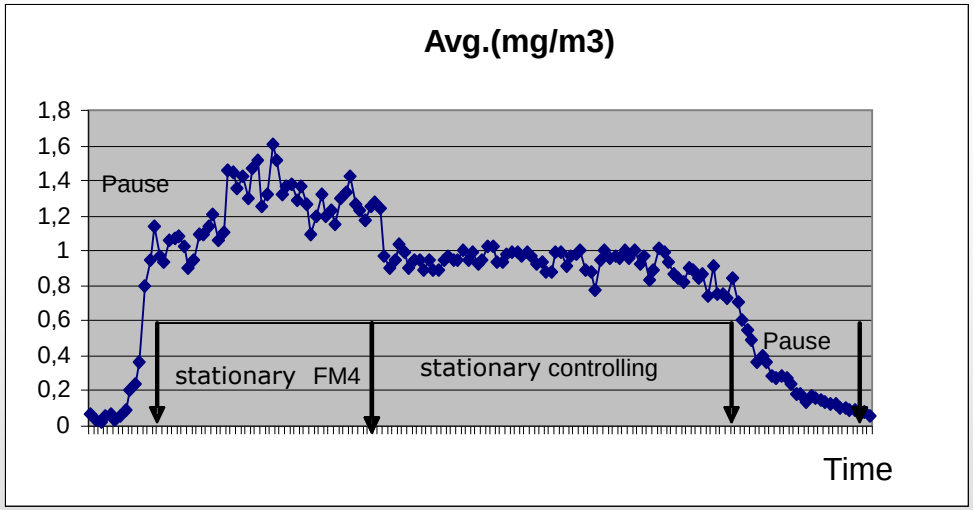
Exposure is primarily through inhalation of aerosols generated during cutting and filleting

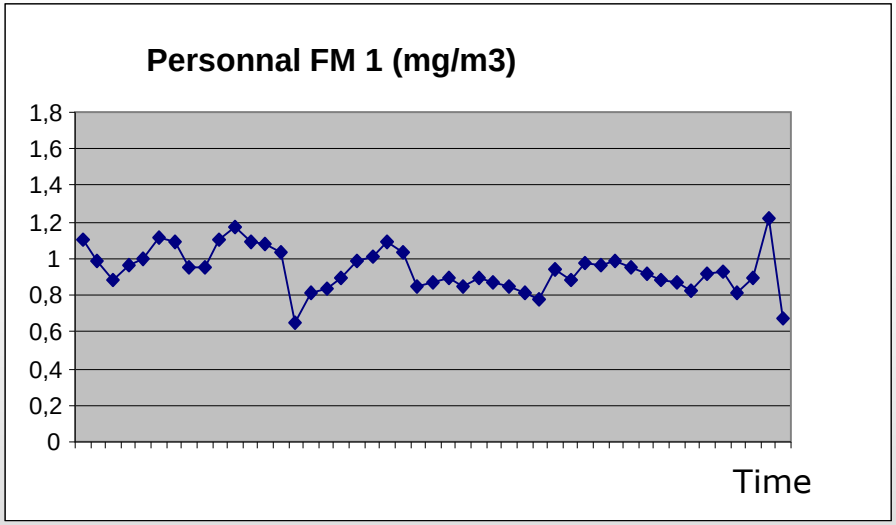
Different particel fraction measured by Climet in a herring factory during 2 h

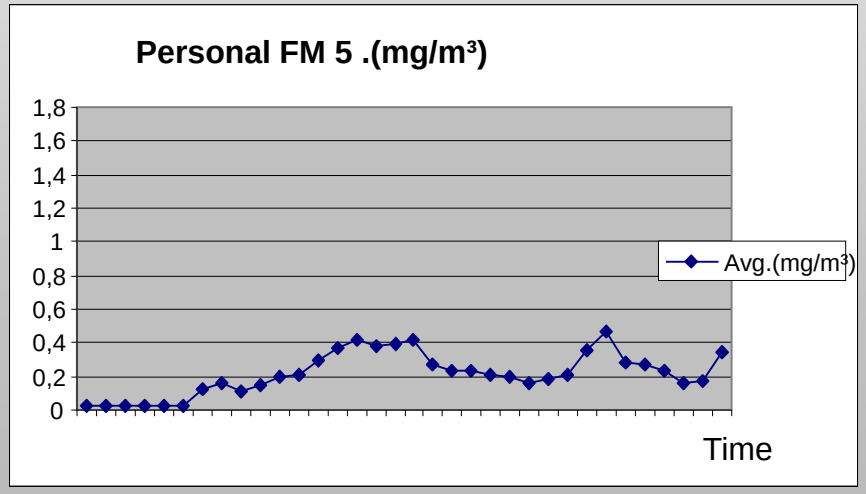


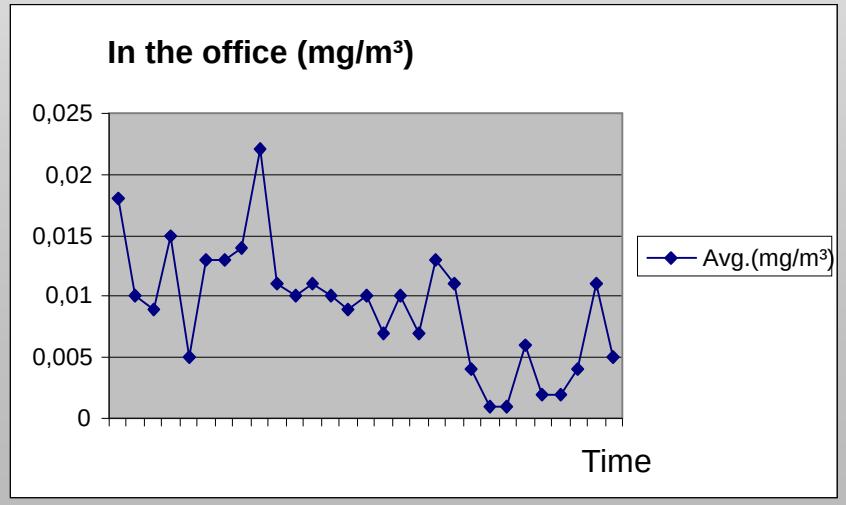
DataRam direct and continous readout instrument, concentration of airborne particels in air mg/m3. Particel size range 0.1-10mm.




Avg.(mg/m3)
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
Pause
stationary FM4
stationary controlling
Pause
Time


Personnal FM 1 (mg/m3)
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
Time


Personal FM 5 .(mg/m³)
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
Avg.(mg/m³)
Time


In the office (mg/m³)
0,025
0,02
0,015
0,01
0,005
0
Avg.(mg/m³)
Time

Work-related symptoms during last year at this factory

Symptoms daily/each week	
Flu-like symptoms	***43%***
Cough with phlegm	***23%***
Irritated throat	***20%***
Rhinitis	***17%***
Wheeze	***9%***

Conclusions

- Asthma and weekly work-related respiratory symptoms were reported more often by filleting fish processing workers than by fishermen
- Flue-like symptoms was more common among all fish processing workers
- Accidents requiring visit to a physician was equally common, about one of five reported that
- Filleting workers are exposed to bioaerosols, fish allergen and others