BIOLOGICAL AGENTS AND FINNISH EXPERIENCE ON OSH IN AGRICULTURE

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OSH services for farmers – Short history

• A National Board of Health working group issued instructions on the implementation of Farmers’ Occupational Health Services (FOHS) in the 1980s. The instructions were based on the recommendations of the massive research and pilot projects.

Working group:
• **OH-nurse, Agricultural adviser**
  OH-doctor, physioterapist
• In municipal health care centres or private firms
Farmers Occupational Health Service System

Regular contacts

- 0 – 1 year

Agreement and plan of action

Negotiation at farm

FOHS on demand

Active client/employer

Health check or interview

- habits, work environment, health status → work ability

Every 1 – 2 (4) years

Farm visit (hazards)

- physical, psychosocial, social work environment

Every 1 – 4 years

Development plan on work environment and methods

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Coverage of FOHS according to production line

- All farmers: 2004 N=1182, 2014 N=2122
- Forestry: 2004 46%, 2014 55%
- Crop farming: 2004 42%, 2014 60%
- Grain growing: 2004 39%, 2014 56%
- Other domestic animals: 2004 34%, 2014 62%
- Pigs: 2004 73%, 2014 74%
- Other cattle: 2004 54%, 2014 68%
- Dairy cattle: 2004 54%, 2014 66%
What benefits from FOHS?

- Improved working conditions: 2004 N=9, 2014 N=19
- Rehabilitation opportunities: 2004 N=1, 2014 N=3
- Something else: 2004 N=1, 2014 N=6
FOHS and training for hazard evaluation and health screening

FOHS personnel has been trained and educated from 1980’s onwards courses at FIOH (mainly Kuopio office).

The focus has been on health hazards, respiratory and skin diseases, ergonomic problems and work load. Also info on PPE

FARM VISIT + report (development plan)

Health check:
- on demand, eg. spirometry
Farmer’s Lung – basic studies in the 1980’s

Work-related respiratory diseases among Finnish farmers

Editors: Erkki O. Terho
        Kaj Husman
        Ilkka Vohlonen

European Journal of Respiratory Diseases

Articles

E. O. TERHO, K. HUSMAN & I. VOHLONEN. Prevalence and incidence of chronic bronchitis and farmer's lung with respect to age, sex, atopy, and smoking

E. O. TERHO, I. VOHLONEN & K. HUSMAN. Prevalence and incidence of chronic bronchitis and farmer's lung with respect to socioeconomic factors

I. VOHLONEN, K. TUPI, E. O. TERHO & K. HUSMAN. Prevalence and incidence of chronic bronchitis and farmer's lung with respect to the geographical location of the farm and to the work of farmers

E. O. TERHO, O. P. HEINONEN, S. LAMMI & V. LAUKKANEN. Incidence of clinically confirmed farmer's lung in Finland and its relation to meteorological factors

K. HUSMAN, M. KOSKENUOJ, J. KAPRIO, E. O. TERHO & I. VOHLONEN. Role of environment in the development of chronic bronchitis

IgG-panel for agriculture at FIOH in 2017

Aspergillus fumigatus,
Eurotium amstelodami,
Micropolyspora faeni,
Paecilomyces variotii
Penicillium brevicompactum,
Rhodotorula glutinis,
Thermoactinomyces candidus,
Wallemia sebi

E. O. TERHO, K. HUSMAN, I. VOHLONEN & R. A. MÄNTYJÄRVI. Serum precipitins against microbes in mouldy hay with respect to age, sex, atopy, and smoking of farmers

K. HUSMAN, I. VOHLONEN, E. O. TERHO & R. A. MÄNTYJÄRVI. Precipitins against microbes in mouldy hay in the sera of farmers with farmer's lung or chronic bronchitis and of healthy farmers

E. O. TERHO, K. TUPI, I. VOHLONEN & K. HUSMAN. Serum precipitins against microbes in mouldy hay with respect to the geographical location of the farm and to the work of farmers

I. VOHLONEN, K. HUSMAN, E. O. TERHO & K. TUPI. Prevalence of serum precipitins against microbes in mouldy hay, and of chronic bronchitis and farmer's lung with respect to farmers' occupational health hazards

M.-L. KATILA & R. A. MÄNTYJÄRVI. Prognostic value of precipitins for working ability in dairy farmers

M. RAUTALAHTI, E. O. TERHO, I. VOHLONEN & K. HUSMAN. Atopic sensitization of dairy farmers to work-related and common allergens
Occupational diseases of farmers

Few ODTS cases

* Type of viral haemorrhagic fever with renal syndrome caused by Puumal virus. The bank vole is the reservoir for the virus.

Source: FSII (Farmers Social Insurance Institution) 2017
Present/past risks – example of prevention in practice

Top 4 risks in our FG - *bacteria, viruses, fungi, organic dust*

FARMER’S LUNG, Allergic Aloveolitis
First study / Dissertation

MARJUT KOTIMAA

OCCUPATIONAL EXPOSURE TO AIRBORNE SPORES OF FUNGI AND ACTINOMYCETES WITH SPECIAL EMPHASIS ON AGRICULTURAL WORK
Farmer’s lung - exposure


Average amounts of microbes (cfu/g) from feed and bedding materials

Kotimaa 1990
Farmer’s lung – exposure control

Exposure pattern changes from the past to the present:

- Cow: Less dry hay
- Cow: Silage in silos or round bales
- Cow: Less straw as drying material, more wood shavings for milking cows
- Swine: Automatic feeding
- Poultry: Automatic feeding and egg collection systems

FOHS and measurement of molds, fungi, bacteria, endotoxins:

No instruments, only visual assessment
Agricultural expert: technical solutions
Animal dusts

**Storage mites** – connection to mouldy material

**Cow dander, allergen Bos D 2**
Protection!!
Training of FOH Services, farmers, substitute workers, general public

- **OH Personnel**, 3-day course on OSH in agriculture, first courses in 1982, this year 4 weeks ago
- **Farmers**, quite seldom with FSII
- **Substitute workers**, time to time
- **General public**, during agricultural fairs

**Substitute/ farm relief workers** act as holiday substitutes and temporary stand-ins for farmers, scheme is based on the Farm Relief Services Act and the Farm Relief Services Decree. Managed by FSII.
Why more respirators than technical control?

- FSII delivers motorised respirators (free of charge) to farmers having compensated occupational asthma or FL (or ODTS) – still not all farmers use those
- Respirators might be the only solution to the problem
- Technical solutions are sometimes expensive and might be difficult to construct
- The support from agricultural experts is not always utilised in FOHS in general and specially with dust control

Studies focused to dust control are reported to FOHS, farmers, FSII, (training, magazines, leaflets, etc)
Use of PPE – years 2004 vs 2014

- Ear muffs when using angle grinder 54 ➞ 70 %
- Protective gloves during chemical use 49 ➞ 62 %
- Protective gloves during milking 17 ➞ 38 %
- Respirators during bedding work 14 %
  • Large variation between production types; milking cow 10%, swine 50%
  • Farmers in FOHS used more PPE than not-joined
Horse stables – bedding materials

• Study 1: wood shavings and peat; The results suggested that peat was a better bedding material for horses than wood shavings regarding the health of both horses and stable workers. (However measurement of dust was not “occupational”)

• Study 2: Quality of different bedding materials; shredded newspaper, sawdust and wood shavings contained lower concentrations of micro-organisms than peat, linen, hemp or straw

• Study 3: Different types of peats produced different concentrations of fungi and endotoxins: weakly decomposted peat produced HIGH concentrations of endotoxins but lower concentrations of microorganisms, but with warmed-up peat and more decomposed peat vice versa
Grain grinding - dust control

The differences in dust concentrations between holes - no holes have been 10-20 fold

Not a single hole

A must

Vilja kasassa tai siilossa
Grain in a stack or in a hopper

Puhaltava ja imevvä mylly
Mill with a fan

Ruokintavauunu
Feed trolley

Not a single hole
Emerging risks – Finnish FG results

Top emerging risks

- **industrialised activities**, farms are bigger, need for employed workers, economical risks, risk of spreading of diseases among animals and also to general population. Economical stress increases *mental symptoms*.

- **new viruses, especially respiratory agents**, FOHS experts need more training to recognize these biological agents. Cooperation with *health care* and *veterinary institutions*.

- **multi-resistant bacteria**
  MRSA-study- Finnish Zoonosis strategy (2013-2017) : the increase of Multi Resistant Bacteria, and especially the resistance of gram-negative bacteria among production animals and meat, import of animals and people, meat import to country. Screening of patients (farming background) entering hospitals is not recommended.

  Methods: questionnaire to swine farmers (ongoing just now)
Emerging risks - cooperation

Health Care
• Resistent tuberculosis in Russia and Baltic states
• In 2016 there were 236 tuberculosis cases in Finland

Farm Environment
• Animal health ETT (Ett.fi)
• Farmer health

Disease prevention in pig farms
INSTRUCTIONS TO FOREIGN EMPLOYEES WORKING ON FINNISH PIG FARMS
Conclusions

- Farmers are still exposed to biological agents
- New threats are risk in future
- Cooperation between institutions needs to be strengthened
- Training, training, training ,...... of FOHS experts and farmers
- Farmers Occupational Health Service is working and still going strong