11. SUMMARY IN SWEDISH

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Exponering för spannmålsdamm kan ge upphov till astma och andra effekter på luftvägarna, t ex hosta, rhinit och tröskdammlunga. Även andra effekter som konjunktivit och dermatit finns rapporterade. Även om en noggrann karakterisering av allergeniciteten (Typ I, IgE-medierad) saknas, har yrkesmässig exponering för spannmålsdamm dock klart visats vara kopplad till immunologiskt svar ledande till inflammation i luftvägarnas glatta muskulatur.

Nyckelord: Astma, hosta, kronisk bronkit, luftvägsobstruktion, rhinit, tröskdammlunga, spannmålsdamm.

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13. APPENDIX

Table A-1.--Predominant microorganisms identified in selected reports on the microflora of grain dust

Location of dust and predominant type of microorganism cultured	Comments and references
I. Airborne dust at harvest:	
Alternaria Ascospores Aspergillus Basidiospores Botrytis Cladosporium Epicoccum Erysiphe Fumago Helminthosporium Paecilomyces Penicillium Puccinia uredospores Torula Ustilago Verticillium	From 1970 to 1972, the microflora of dust around a combine harvester were studied. A cascade impactor or Anderson sampler was used for sample collections. The concentrations of spores in the combine driver's breathing zone ranged from 0.5 to 34 x $10^6/m^3$ and from 3.5 to 200 x $10^6/m^3$ in areas close to the dust sources. The primary spore types identified were Cladosporium and Alternaria, which which were found in basically all the samples. Actinomycetes and bacteria usually accounted for less than 10% of total spores in the dust. (Lacey 1980)
II. Dust deposits in silos and elevators:	
Aspergillus niger Bacillus cereus B. mesentericus B. mycoides B. subtilis Fusarium Mucor Penicillium	Grain dust from an elevator and threshing floor was cultured to determine the types of microorganisms present and the number of organisms per gram of dust. The total microbial count per gram of grain dust ranged from 168,000 to 544,000 in five samples. (Stepanov 1967)
Acinetobacter Aspergillus glaucus A. fumigatus Bacillus cereus	A 10-year study in Poland that measured the viable microorganisms in the air at a variety of worksites

Table A-1 (Continued).--Predominant microorganisms identified in selected reports on the microflora of grain dust

Location of dust and predominant type of microorganism cultured	Comments and references
Erwinia herbicola Pseudomonas Staphylococcus epidermidis Streptococcus lactis S. pyogenes Streptomyces	including grain stores and mills. Air sampling was done with an impact sampler situated as close as possible to the workers at approximately 120 cm above the floor. The mean concentration of viable organisms in the air was 129,200/cm^3. (Dutkiewicz 1978)
Aspergillus candidus A. flavus A. fumigatus A. glaucus A. versicolor Bacteria Cladosporium species Penicillium species Yeasts	Sixty-two samples of dust deposits were taken from grain elevators in Manitoba, Canada. The dust deposits were examined microscopically and by culturing. The predominant colonies isolated from the samples were Penicillium species, Aspergillus fumigatus, Aspergillus flavus, Aspergillus candidus, Streptomyces albus, and Thermoactinomyces vulgaris. Bacteria were ubiquitous. (Lacey 1980)
Aspergillus flavus A. fumigatus A. slavers A. terreus Cladosporium species Fusarium moniliforme Mucorales Penicillium puberulum P. viridicatum	Grain dust was collected from two terminal grain elevators on the Mississippi River near New Orleans, U.S.A. Twelve samples were collected from the dust that settled on ledges in the elevators or dock areas. Most of the samples were from corn. The mean of the total colony-forming units was almost 10 x 10^6/g of dust. (Palmgren et al. 1983)
Alternaria species Aspergillus fumigatus A. niger A. umbrosus Cladosporium species Micropolyspora faeni Mucor species	Dust samples were collected from farms of 24 patients with farmer's lung disease in Finland. Eleven farms of siblings of patients were used as a reference group. Airborne dust samples were

Table A-1 (Continued).--Predominant microorganisms identified in selected reports on the microflora of grain dust

Location of dust and predominant type of microorganism cultured	Comments and references
Paecilomyces species Penicillium species Rhizopus species Streptomyces species Thermoactinomyces vulgaris Yeasts	taken during work using an Anderson sampler. The total mean spore population was statistically significantly higher on the farms of patients with farmers lung (range: 0.04 to 13.7 x $10^6/m^3$) than on reference farms (range: 0.02 to 3.6 x $10^6/m^3$). (Kotimaa et al. 1984)
Acinetobacter Enterobacter agglomerans Klebsiella Pseudomonas Serratia	Five grain elevators along the Mississippi River near New Orleans were sampled over a 2-year period to determine their bacterial content. Dust samples were collected from the breathing zones of workers using personal air samplers and sterile filters of 0.45-mm pore size. Twenty dust samples were also collected from various sections of the elevators where grain dusts were deposited. Settled grain dust had populations of bacteria that ranged from 1.9 to 53.4 x $10^6/g$ (total plate counts). The range was 0.9 to 14.8 x $10^6/g$ for gram-positive bacteria and 0.1 to 5.0 x $10^6/g$ for gram-negative bacteria. (DeLucca et al. 1984)
Alternaria tenuis Aspergillus fumigatus Cladosporium Coryneform Fusarium Micrococcus Penicillium expansium Streptomyces	Airborne dust samples were taken from 21 farms of farmers who were undergoing a study to determine the occurrence of symptoms (febrile and airway-obstructive) and their immune status. Twenty-four samples were collected from the breathing zone on a 0.1- m filter while the subject was handling grain or hay. (Malmberg et al. 1985)

Table A-1 (Continued).--Predominant microorganisms identified in selected reports on the microflora of grain dust

Location of dust and predominant type of microorganism cultured	Comments and references
Alternaria *Aspergillus* *Cladosporium* *Fusarium* *Mucor* *Penicillium* *Ustilago* Bacteria	Airborne dust samples were obtained with personal air samplers from 250 individual workers in eight different grain elevators in the Duluth-Superior area in October and November 1977. Samples were also collected from Duluth municipal workers as a reference. Random samples were also collected from dust deposits in different locations in the grain elevators. Bacteria were the most prevalent microorganisms in the nonviable spore counts of airborne dust for grain workers. The count ranged up to 3.6×10^6 spores/m^3, whereas city worker samples ranged only up to 1.4×10^5 spores/m^3. (NIOSH 1986a)

Table A-2.--Measurements of grain dust concentrations from eight terminal-transfer elevators in Canada*

Occupational group, process, or area monitored	Type of sample		Number of samples	Total dust mg/m^3		Respirable dust mg/m^3	
	Personal	Area		Mean	Range	Mean	Range
Laker scraper	X		9	29.1	2.52-82.0	1.01	0.34-2.04
Marine tower leg operator	X		3	1.36	0.68-2.50	0.34	0.30-0.38
Trackshed sampler	X		37	4.74	0.47-25.2	0.85	0.19-2.06
Trackshed shoveler	X		19	37.7	6.20-83.6	4.53	0.13-19.7
Trackshed spoutman	X		16	8.57	1.80-28.8	1.21	0.12-5.50
Trackshed doorman	X		22	23.2	0.51-83.0	2.15	0.23-11.1
Trackshed dumperman	X		5	1.84	0.42-3.12	0.52	0.18-0.85
Trackshed area		X	12	9.41	0.80-31.4	0.99	0.10-2.62
Trackshed basement area		X	12	35.5	5.00-71.0	2.83	0.60-1.10
Receiving tunnel area		X	13	109	15.7-345	13.7	0.22-57.5
Workhouse basement sampler	X		6	23.5	8.19-38.1	3.96	1.18-5.79
Workhouse basement area		X	21	24.7	0.59-128	2.37	0.24-15.8
Scale floor weighman	X		52	5.31	0.66-42.0	0.82	0.12-1.97

See footnote at end of table.

Table A-2 (Continued).--Measurements of grain dust concentrations from eight terminal-transfer elevators in Canada*

Occupational group, process, or area monitored	Type of sample		Number of samples	Total dust mg/m^3		Respirable dust mg/m^3	
	Personal	Area		Mean	Range	Mean	Range
Scale floor area		X	24	8.50	0.19-92.0	0.95	0.10-4.50
Distributor on distributor floor	X		33	10.8	1.25-40.1	1.05	0.22-2.50
Distributor floor area		X	20	6.90	0.21-21	0.77	0.05-2.10
Bin floor annex man	X		58	18.3	0.41-207	1.77	0.18-7.04
Bin floor areas		X	75	17.3	0.22-201	2.30	N.D.-31.70
Annex basement tunnelman	X		38	8.13	0.54-43.6	1.60	0.23-8.20
Annex basement area		X	41	16.7	0.18-178	2.53	0.08-27.0
Ground floor feedtender	X		21	27.2	2.70-144	1.73	0.37-11.3
Ground floor area		X	12	10.3	0.54-53.5	1.73	0.15-8.14
Dryerman in dryer area	X		3	10.9	4.60-21.0	0.56	0.37-0.68
Dryer area		X	2		3.10-8.80		0.14-0.78
Cleanerman on cleaner floor	X		30	7.20	0.64-27.3	0.87	0.27-2.70

See footnote at end of table.

Table A-2 (Continued).--Measurements of grain dust concentrations from eight terminal-transfer elevators in Canada*

Occupational group, process, or area monitored	Type of sample		Number of samples	Total dust mg/m^3		Respirable dust mg/m^3	
	Personal	Area		Mean	Range	Mean	Range
Cleaner floor area		X	12	9.87	0.27–45.0	1.05	0.10–3.40
Towerman in transfer gallery	X		14	67.0	1.23–412	4.83	0.17–19.4
Galleryman in transfer gallery	X		21	33.2	0.75–374	3.17	0.16–34.0
Transfer gallery area		X	76	68.7	0.24–781	9.78	N.D.–76.3
Sweeper in elevator	X		49	66.5	1.90–309	5.30	1.37–47.5
Millwright in elevator	X		6	36.4	0.83–128	1.99	0.26–6.10

*Data from Farant and Moore (1978).

Table A-3.--Exposure concentrations from six exporting grain elevators in the U.S.A.*

Occupational group, process, or area monitored	Type of sample		Number of samples	Total dust mg/m^3		Respirable dust mg/m^3	
	Personal	Area		Mean	Range	Mean	Range
Weigher	X		16	4.42	0.79-75.83	0.18	0.005-1.35
Barge person	X		27	2.79	0.45-13.87	0.32	0.11-0.76
Millwrights and electricians	X		74	2.24	0.12-87.98	0.27	0.03-2.83
Laborers	X		56	7.14	0.43-113.90	0.63	0.11-30.86
Bin top person	X		39	6.28	0.5-87.7	0.36	0.1-2.02
Dumper	X		25	2.87	0.54-50.2	0.32	0.01-2.32
Cleaner	X		6	7.39	4.67-13.42	0.43	0.19-1.01
Belt operator	X		56	4.19	0.30-92.10	0.25	0.01-3.30
Driver	X		42	2.72	0.31-131.50	0.33	0.17-0.79
Others	X		12	2.48	0.28-78.73	0.91	0.06-27.53

*Data from NIOSH (1980).