

COLD PROBLEMS AND UPPER LIMB MUSCULAR STRAIN IN FOOD PROCESSING INDUSTRY

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Due to repetitive and monotonous manual work, cold environment, cold products, air movements and moisture, workers in the cooled facilities of food processing industry face many health and performance risks. Upper limb overuse symptoms are common reason for complaints and sick leaves. However, the role of cold in upper limb performance, physical strain, fatigue and overuse symptoms in food processing industry are not fully understood. Therefore, a questionnaire study was done in four companies of meat processing industry and one dairy. Personal characteristics of workers, their work history, work environment and experienced cold hazards as well as health problems were asked from 1490 workers. Moreover, during ca. 4 h sessions of sausage packing at 5 - 7°C, skin temperatures (12 sites of upper limbs) and work load (assessed by electromyographic activity of *m. extensor digitorum* and *m. flexor carpi radialis*) were measured in female workers with (n = 6) and without (n = 6) upper limb musculoskeletal symptoms. The responses (n = 1117) to the questionnaire show that 51 % of the respondents worked at 0 - 5°C and 34 % at 6 - 10°C. Complaints of hand and finger (89 % of the respondents), wrist (58 %), toe (59 %) and shoulder (52 %) cooling were most common. Musculoskeletal pain was more frequent in cold environment in all parts of the body, especially in hands, arms and neck, when compared to work in Finnish food processing industry in warm facilities (Koskinen *et al.* 1997). In comparison to men, considerably higher percentage of women suffered cold problems during the early working years and the years did not increase the women's cold problems as it did in men. The measurements showed that workers with musculoskeletal symptoms had consistently lower (p<0.05) skin temperatures in shoulder (above *m. deltoideus*) area and after ca. 3 h work also in forearm (above *m. extensor digitorum*) and neck-shoulder (*m. trapezius*) areas. Muscular strain of forearm muscles was negatively correlated (p<0.05) with forearm skin temperatures. In conclusion, the results show that in food processing industry there are marked cold problems especially in the neck-shoulder area and in the hands and fingers, cooling significantly increases muscular strain of work and musculoskeletal symptoms seem to be associated with decreased shoulder and arm skin temperatures.

Koskinen, K., Olkinuora, P., Könni, U. & Kaleva, S. (1997) Work environment and workers' welfare in food processing industry (in Finnish). *Työ ja Ihminen* 10: 91-97.

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