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HEAT BALANCE DURING SELF-PACED WALKING AT **-12** °C

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Exercise Is an important behavlourai instrument to adjust thermally to different environments. A study was undertaken, In which subjects in a glven and constant environment were asked to change walking speed to attain thermal neutrality.

Eight volunteers (men. **21-29** years) partlclpated In the study. Each subject performed double identical experiments. The experiments took place in'a ciimatlc chamber at **-12** C, alr velocity around 0.5 m/s. SubJectswere clothed In a three-layer cold protectlve clothing. The Insulation value of the clothing ensemble was measured on a standing thermal manlkln (I_{tot} **-2.15** clo, I_{cl} **=1,65** clo). Subjects walked on a treadmill in **120** mln. The thermal Index for cold environments (REQ was used to calculate an amblent temperature. Thermal equillbrlum of the subject durlng an exercise Intensity of **3** met would be achieved at an alr temperature of -9 C. The amblent temperature was set at **-12** C to create a sltuatlon where the subject would feel cool. During the experlments. subjects were told to adjust their walking speed (and consequently their metabolic rates) on **3** occasions (30,50,70 m(n) to achleve thermal neutrality. Subjective ratings were made on perceived body, hand and foot temperatures, exertlon and comfort.

There was no difference of measured or calculated values between the two experlments. Mean skln temperature of the last half hour of the experiment was **31.5** and **31.1** C (first and second experiment). Rectal temperature was **37.9** C in both experiments. Evaporative heat loss (E_{sk}) was **10.2** and **8.4** W/m . I_{clr} was **1.44** and 1.33 clo. Subjectlve ratings on perceived body temperature was neutral to slightly cold. T_{sk} followed the comfort criterla prediction of Fanger. ε_{sk} was considerably lower than predlcted by the same criteria.

There was little varlabiilty in thermal physlologlcal and subjectlve responses In the studied group of subjects. The acceptance for thermal comfort was neutral to sllghtly cold. Evaporative heat loss In the comfort criteria of Fanger is too hlgh when compared with our data. Results suggest that the sensation of thermal neutrality In the cold is well correlated wlth skin temperature, whereas sweat evaporation only has marginal Influence.