



COLD WINTER EXPERIENCES

Cold enough? Too cold?

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INTRODUCTION

- According to the World Tourism Organization (UNWTO) international tourist arrivals grew by over 4% in 2011 to 980 million arrivals.
- Tourist arrivals to Europe reached 503 million (+ 6%) in 2011.
- The latest UNWTO World Tourism Barometer forecasts international tourism to reach one billion in 2012

GROWING BUSINESS



- In the North tourism is growing fast
- New business opportunities
- Mainly small businesses
- Vital and growing business

QUALITY AND SAFETY

- The consumer needs and expectations are high – the consumer rights and the new consumer law
- The image as a safe and high quality destination with the sustainable services will be essential for the future northern tourism (e.g. Finnish tourism strategy 2020)
- Finland is one of the safest travel destinations worldwide - still the cold can be the factor that can expose for risks

COLD WINTER EXPERIENCES

- Tourist experiences should be memorable in a positive way
- In a harsh weather conditions pleasure and thermal comfort can be affected by thermal stress
- Tourists can feel cold very stressful
- Degree of discomfort and cold induced pain should stay in an acceptable level

SAFER SERVICES FOR ALL

- The body can defend against cold by physiological changes and normally maintains the ideal body temperature
- Sometimes these mechanisms do not work properly - ability to communicate or activate the mechanisms can be limited

The aim:

Safer services for the special customers

- by identifying the risks
- by developing service processes and equipment

RISKS AND REQUIREMENTS

- 1 Survey of the risks and requirements of the winter outdoor activities
 - 2 Thermoregulatory responses of the customers and the guides
 - 3 Thermoregulatory responses of the customers with disabilities
 - 4 Product safety of the outdoor activities in winter
- Risk analysis – Guidelines and good practices

METHODS

I RISK QUESTIONNAIRE

II THERMAL MEASUREMENTS



I RISK QUESTIONNAIRE

- Carried out in the reindeer tourist companies in 2010-2011 in Finland
- Internet questionnaire (Webropol) or by post to 100 reindeer tourist companies
- Themes: Economics, Clothing, Cold injuries, Customers with special needs and Safety management
- Response rate 26 %

RESULTS

1 ECONOMICS

1. Corporation form

Reindeer herder/natural economy	23,8 %
Sole trader	23,8 %
Limited liability company	28,6 %
Limited partnership	14,3 %
General partnership	4,8 %
Cooperative	4,8 %

2. Percent of the subcontractors	60 %
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3. Employees (not family members)	
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Yes	47.6 %
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No	52.4%
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4. Net revenue 2010	
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Over 40 000 €	61,9 %
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11 000 € - 20 000€	9,5 %
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21 000€ - 40 000€	14,3 %
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Below 10 000 €	14,3 %
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2 PROBLEMS IN CLOTHING

1. Insufficient amount of cloth in relation to the environmental conditions 65 %
2. Problems in head protection 59 %
3. Inappropriate footwear 47 %
4. Insufficient gloves 41 %
5. Inappropriate quality of the clothing 35 %

3 COLD INJURIES

- Small cold injuries 41 % (redness and tingling of the skin)
- The most significant reason (47 %) for the cold was considered to be the insufficient clothing
- Problems related to the health of the customer
→ not observed by the entrepreneurs (94%)

REASONS?

- Unfamiliarity 72,2 %
- Ignorance of the guidance 54,4 %
- Lowered cold tolerance 36,4 %
- Physical passivity 27,3 %

4 RESCUE PREPAREDNESS

1. First aid training	93,8%
2. Proper rescue and first aid equipment	81,3%
3. Safety education	68,8%
4. Emergency plan set up	75 %

DEVELOPMENT SUGGESTIONS

1. First response fire fighting training
2. Need for the education (field skills?)
3. Need for the first aid skills improvement
4. Updated maps needed for the rescue operations,
imperfections in location coordinates
5. Inadequate first aid kits
6. Problems in routing, common safari routes with the husky
safari operators

5 SPECIAL CUSTOMERS

Some challenges

1. Quick changes in the weather conditions
2. Short preparedness time - Information about the customer with special needs is gained too late
3. High customer expectations
4. Inappropriate equipment or infrastructure
5. Inadequate service procedures
6. Communication difficulties

II THERMAL MEASUREMENTS

1 Temperatures, physiological strain and thermal sensation

2 Clothing insulation

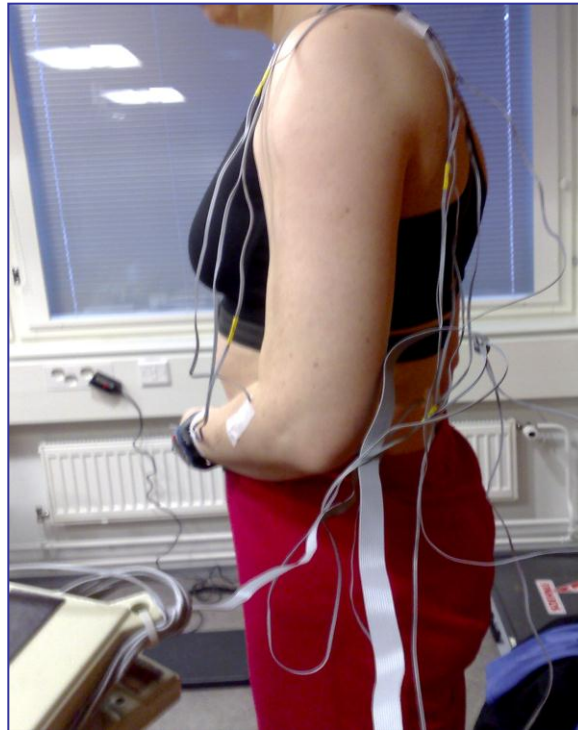
3 Evaporation

4 Ambient temperature and wind

THERMAL RESPONSES

- Evaluation of the physiological changes in cold and the risk assessment
- By monitoring voluntary test customers, guides and special customers (disease affecting to the blood circulation)
- In nature conditions during the reindeer safari
- During the study test persons attended the service program normally

SKIN AND CORE TEMPERATURE



ENVIRONMENTAL THERMAL MEASUREMENTS



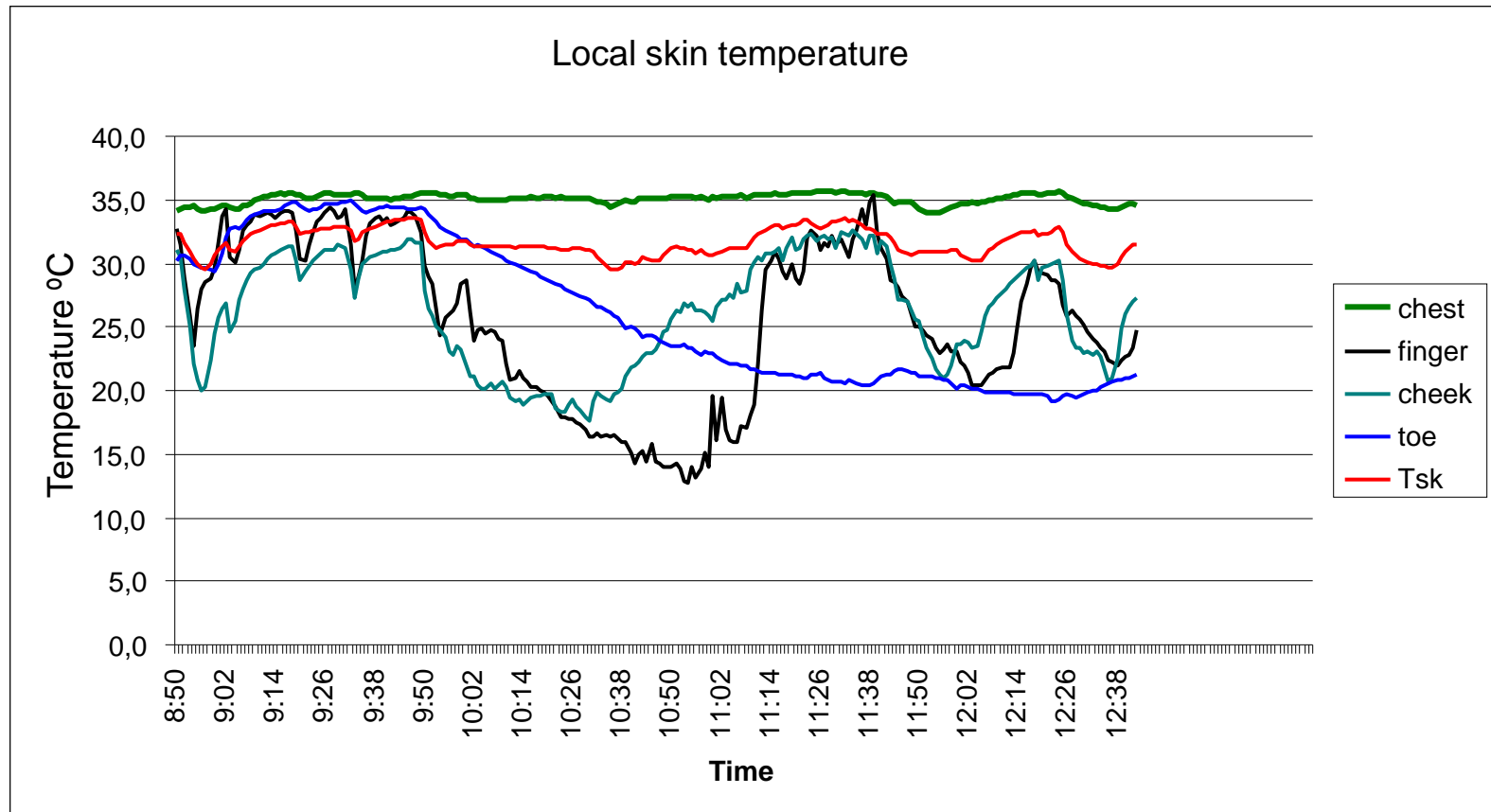
OTHER METHODS

- ASSESSMENT OF CARDIOVASCULAR STRAIN
- BODY WEIGHT
- EVALUATION OF EVAPORATION
- THERMAL SENSATIONS

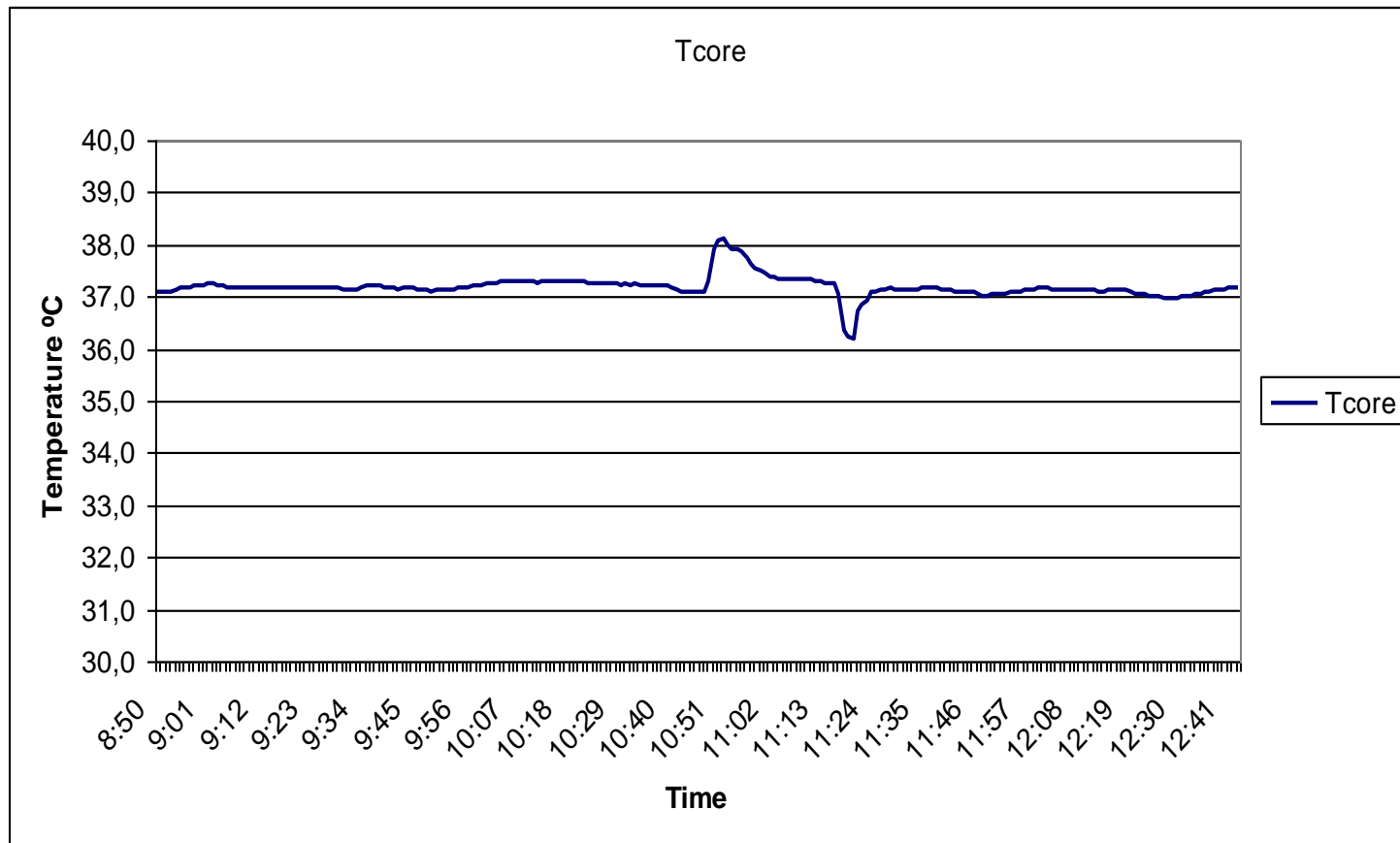


PILOT MEASUREMENTS 2011

EXAMPLE 1: LOCAL SKIN TEMPERATURE VARIATION



EXAMPLE 2: BODY CORE TEMPERATURE



MEAN SKIN TEMPERATURE (T_{sk})

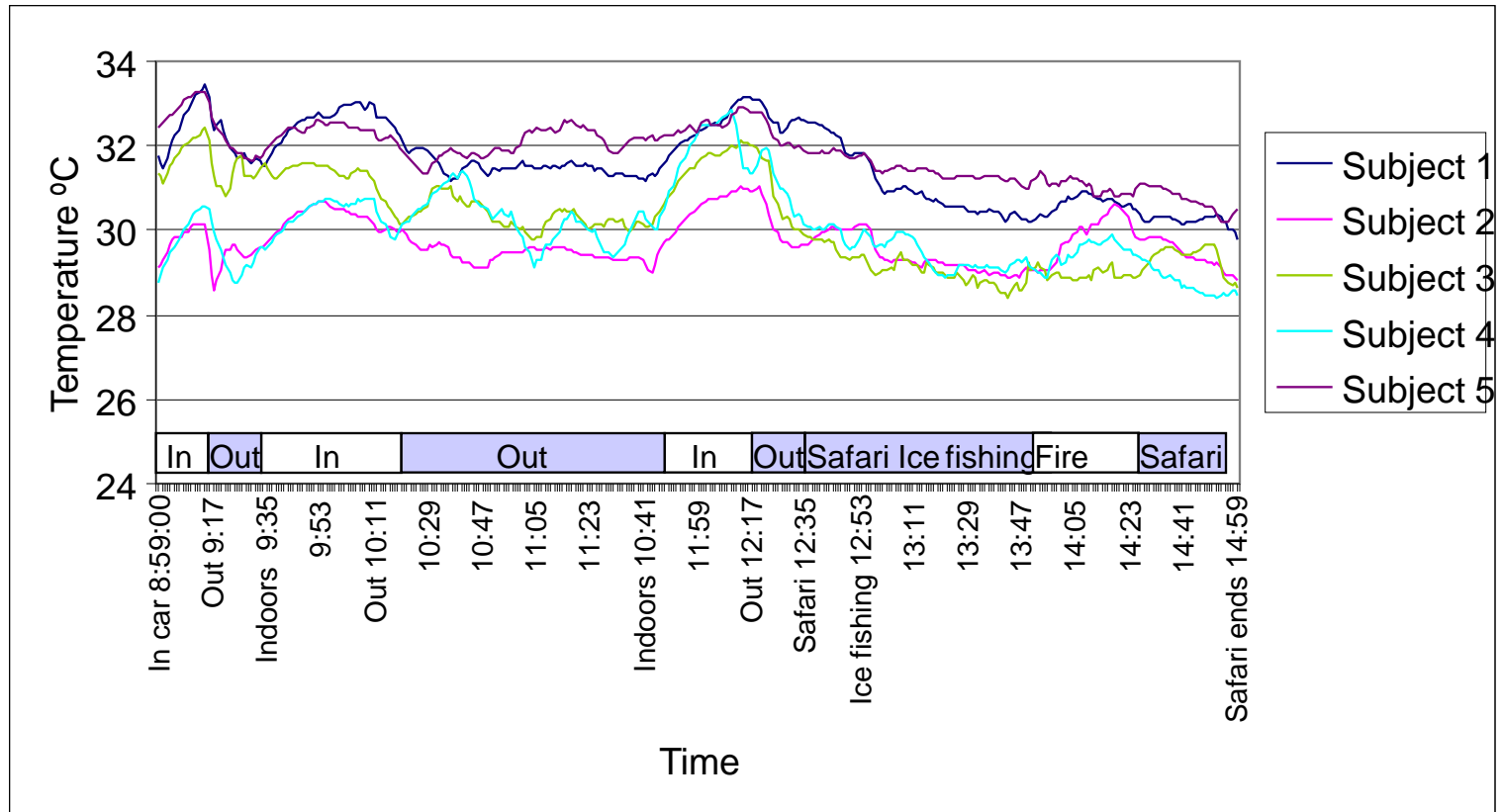


Fig.1. Mean skin temperature (T_{sk}) of the five subjects during the safari day

FINGER TEMPERATURE (T_{finger})

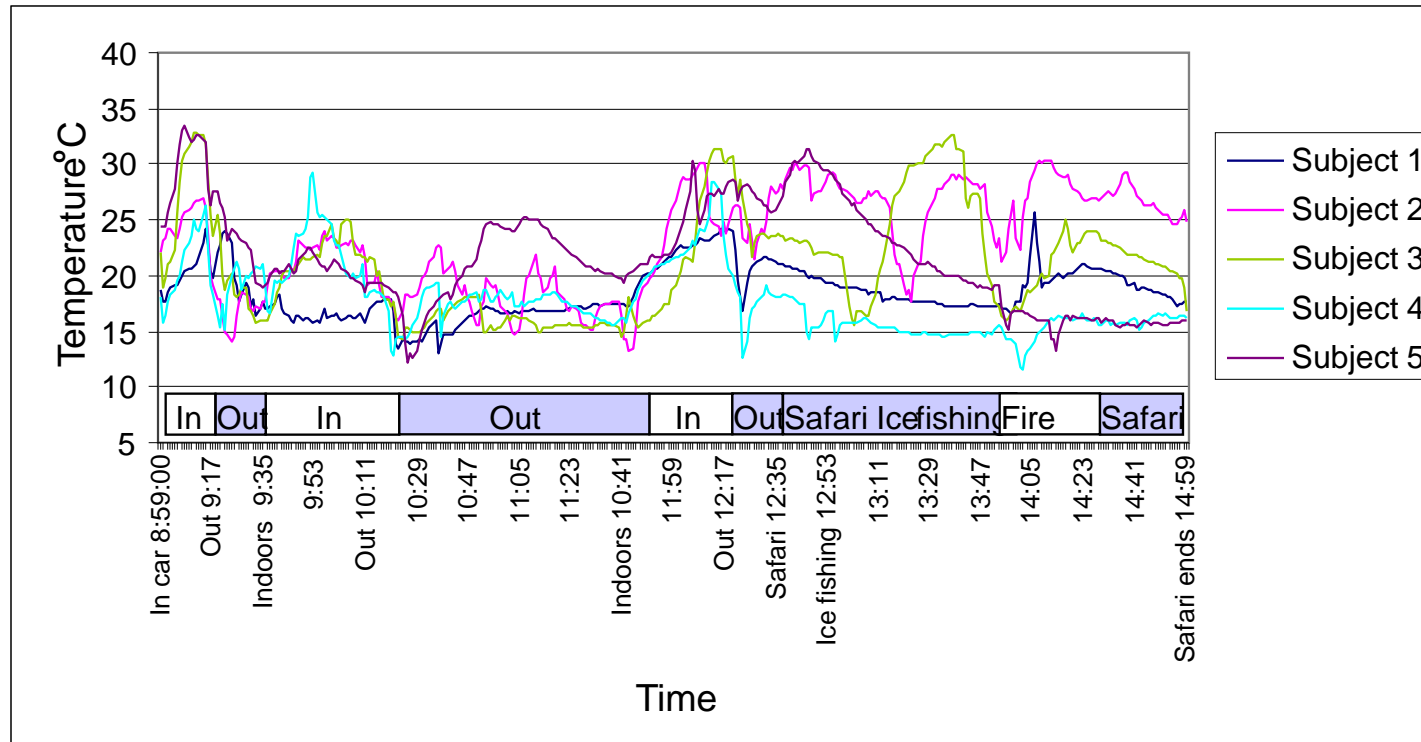


Fig. 2. Finger temperature (T_{finger}) of the five subjects during the safari day

TOE TEMPERATURE (T_{toe})

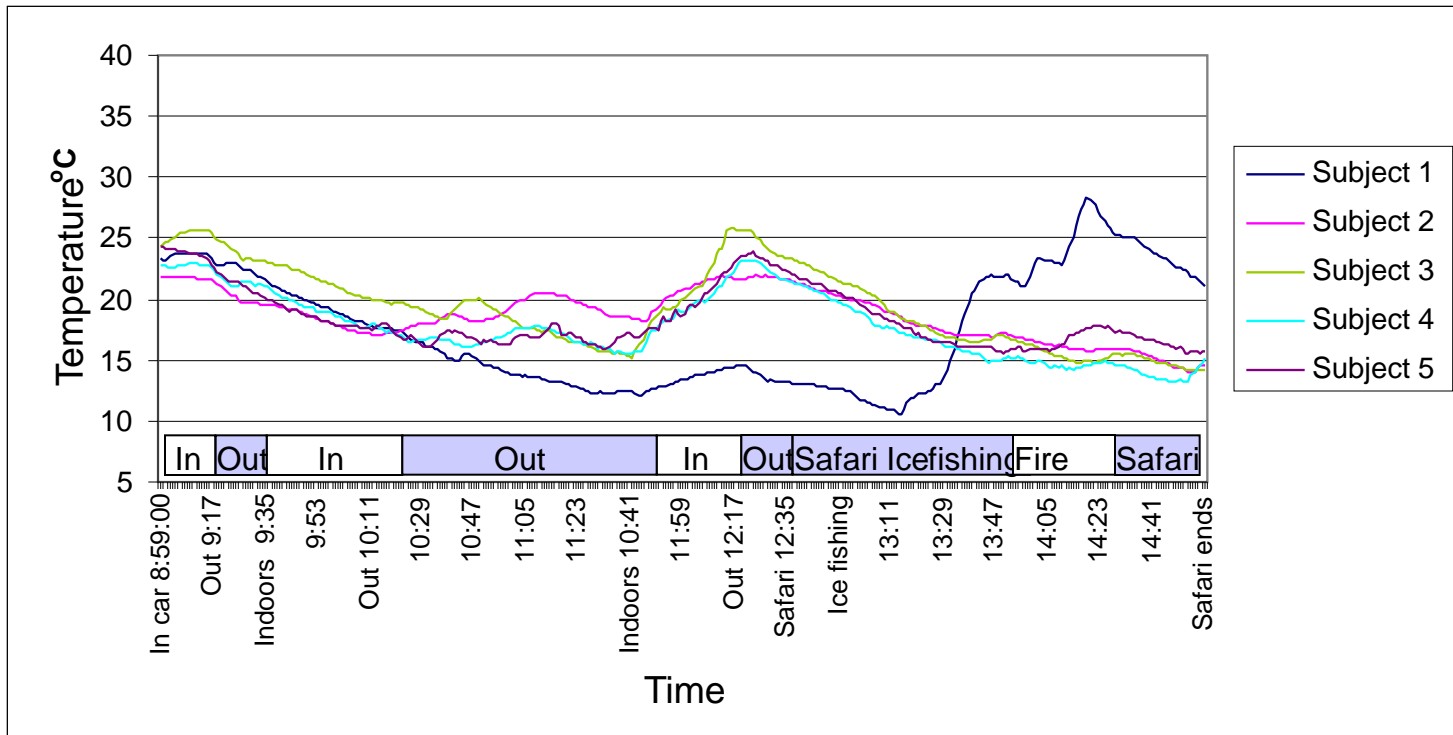


Fig. 3.

Toe temperature decreased clearly during the outdoor activities and increased during the indoor lunch. T decreased again after the reindeer safari and ice fishing on the lake. T_{toe} of the subject 1 differed markedly compared to others.

CHEEK TEMPERATURE (T_{cheek})

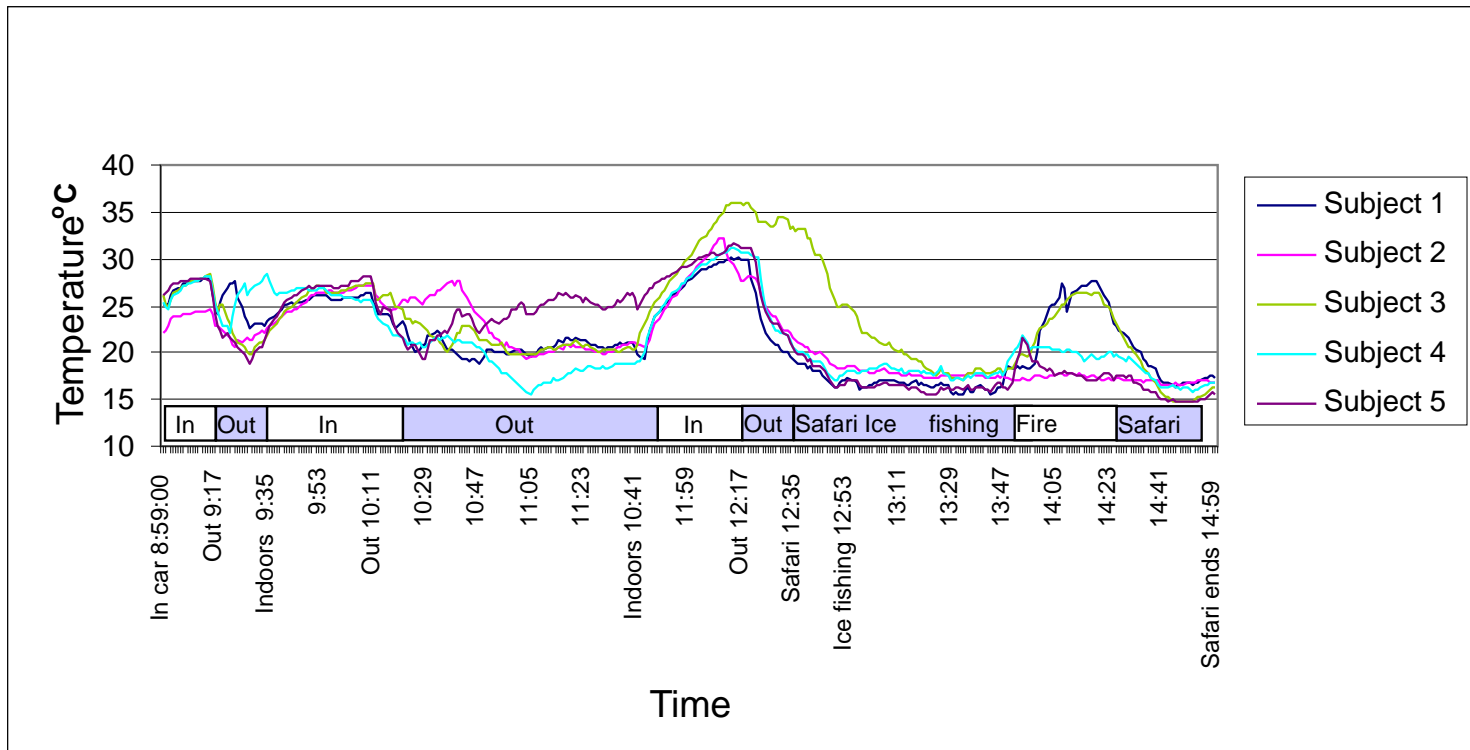


Fig. 4.

Cheek temperature (T_{cheek}) changed quite obviously depending on the activity decreasing during the outdoor activities (Fig. 4.). The cheek temperature rose indoors and by the fire.

EXPERTS IN THE NORTH



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IN COOPERATION WITH

Local reindeer herders and their customers

Finnish Institute of Occupational Health, Oulu

Institute of Biomedicine, Department of Physiology, University of Oulu



THANK YOU FOR YOUR ATTENTION!