# Microclimate during Long Distance Transports of Cattle and Pigs

Preliminary Results of a Project of the German Federal Research Institute for Animal Health

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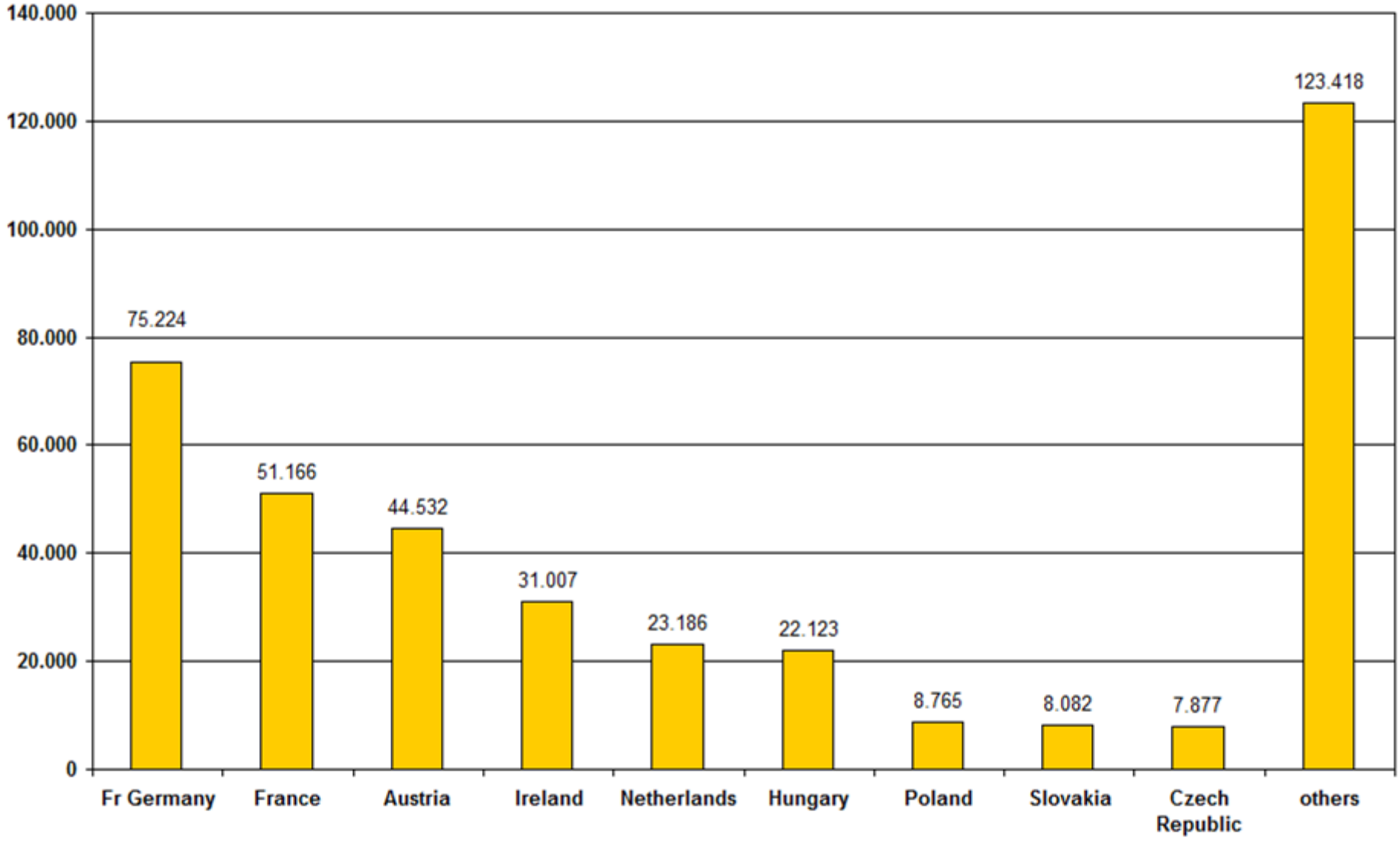
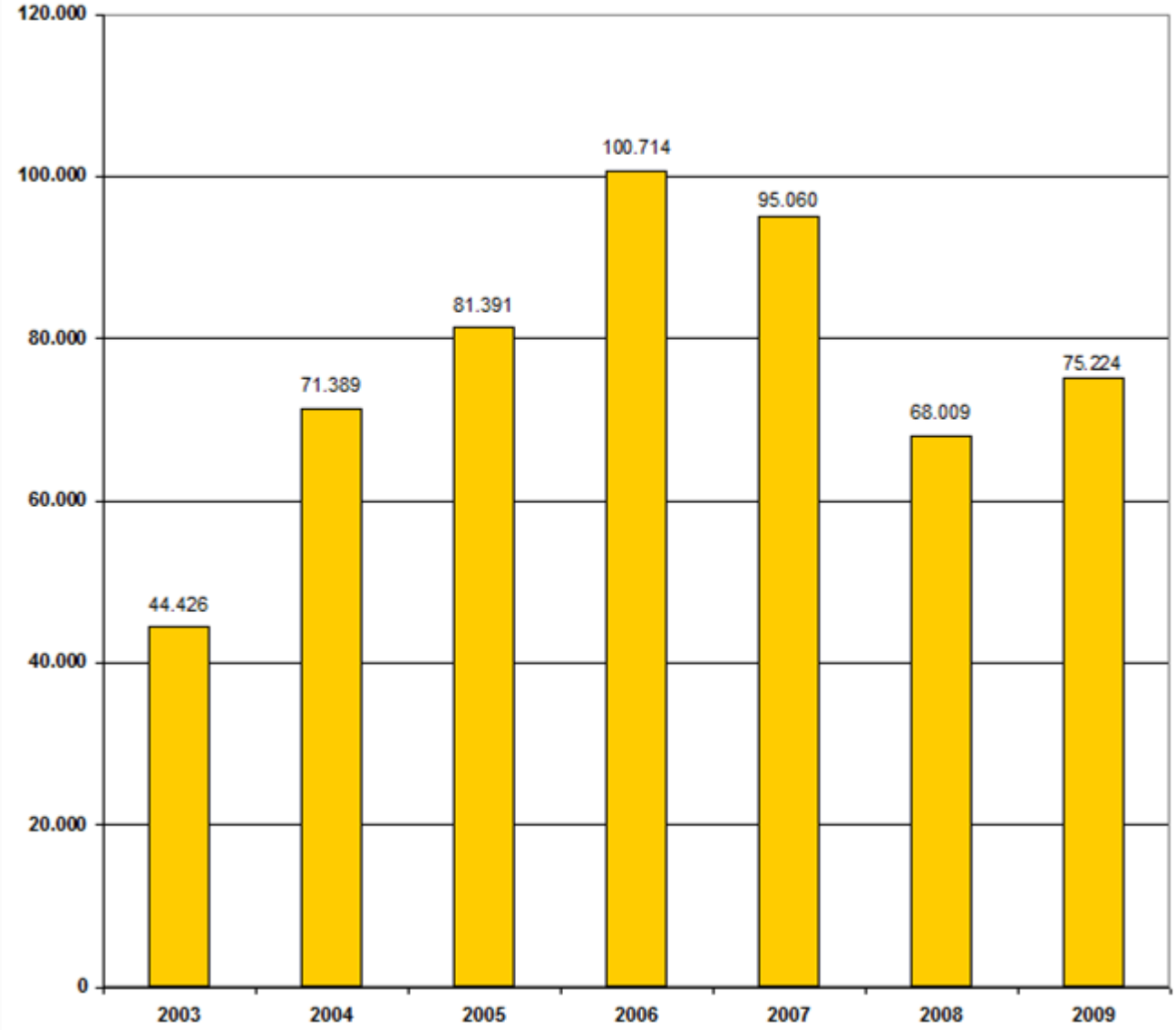
# Exported Breeding Bovines in 2009 (EU Member States)

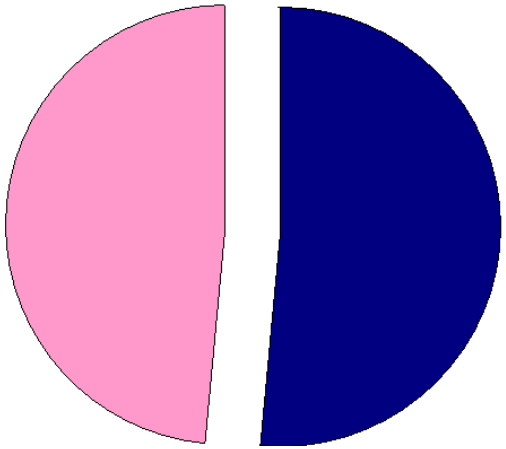



(Eurostat, 12 April 2010)

# Exported Cattle from Germany




**Destinations 2009**



48.5 %
to 3rd Countries

51.5 %
to EU MS

(destatis, March 2010)

# Aim of the Project

- Recording the local extreme point of climate under changing conditions in the transportation lorries, deduction of the minimum number of sensors
- Inclusion of air movement (amongst temperature and humidity) as determining factor of the animals‘ thermoregulation
- Inclusion of physiological parameters of the animals‘ thermoregulation
- Developing of parameters to report thermic stress the animals are exposed to during the transport
- Research on regularities between outside and inside temperature in the transportation lorries
- Use of commercial transports to reach results under practical conditions

# Term of Project:
# 1 November 2007 – 31 January 2011

Number of Transports:

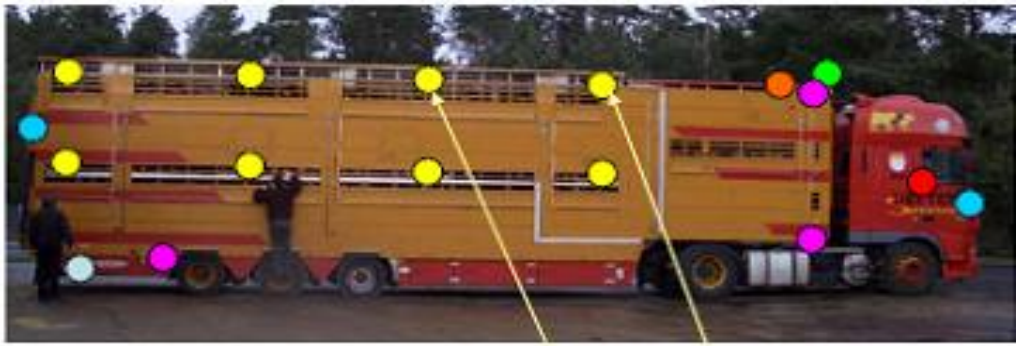
| | Summer Season | Winter Season |
|---|---|---|
| Pig | 7 | 7 |
| Cattle | 7 | 6 |

Cattle Transport:

Pig Transport:

# Localisation of Climate Sensors for Cattle Transport

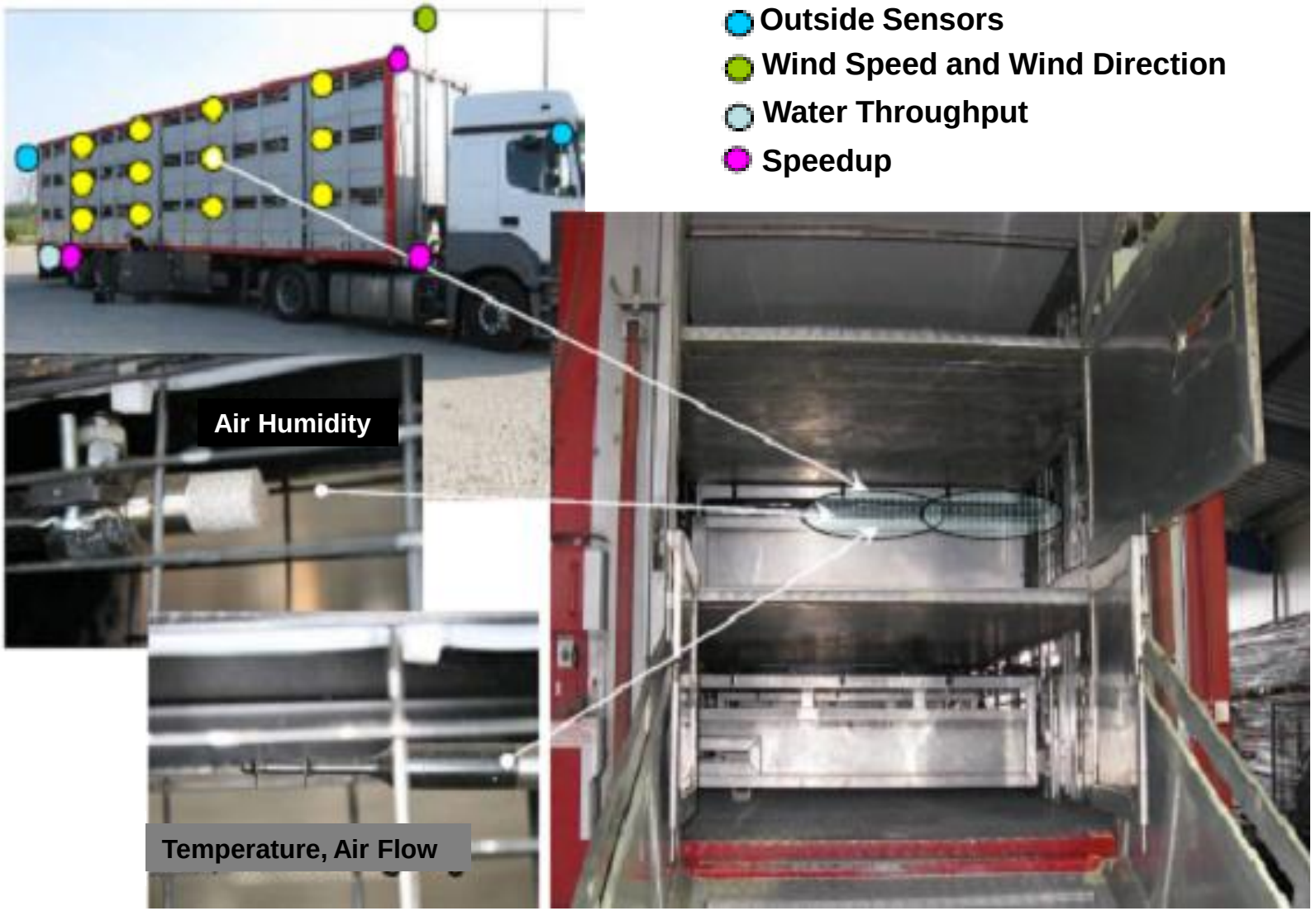
Air Temperature
Air Humidity
Air Flow



- **Wind Speed**
- **Outside Sensors**
- **Sensors**
- **Increasing in Speed**
- **Water Throughput**
- **Insolation**
- **Travel Speed**

## Sensors for Pig Transport:

- **Sensor Beams**
- **Outside Sensors**
- **Wind Speed and Wind Direction**
- **Water Throughput**
- **Speedup**



# Animal Parameters

- Body Temperature
- Heart Rate
- Blood Samples:
  - 4 groups at 4 animals
    - Energy balance and water balance, „Stress“
    - 12 hours before, directly before, directly after, 12 hours after the transport
  - Water Input
  - Behaviour (standing / lying, 4 groups)

## 13 Cattle Transports

Ukraine in Winter

France, Croatia and Serbia in Summer

## 14 Pig Transports

Hungaria and Circuit Germany in Summer

Circuit Germany in Winter

**<u>Reasons for delay</u>:**

**- Supplying Sensors (nearly 1 year!)**

**- Failure during data handling due to a programme error**

**- Organisation of Pig Transports**

**- Local Access to Animals (Ukraine)**

**- Breakdown of the Export Market**

# Pig Transport:
# Inside Temperature of Lorry and Air Flow

Inside Temperature (°C)

25,00
24,00
23,00
22,00
21,00
20,00
19,00
18,00
17,00
16,00
15,00

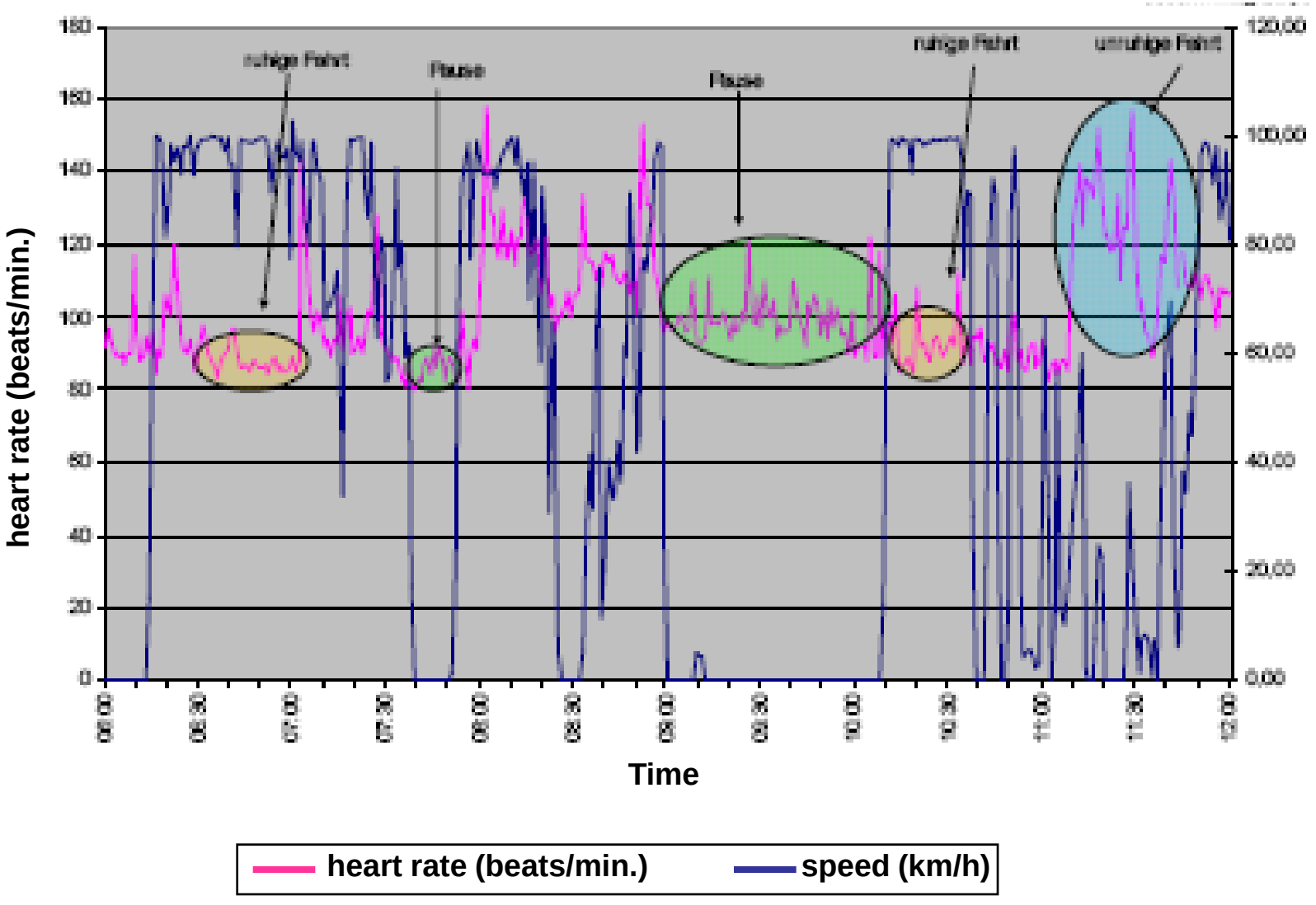
9,00
7,00
5,00
3,00
1,00
-1,00
-3,00
-5,00

7:-13 8:-13 9:-13 10:-13 11:-13 12:-13 13:-13 14:-13 15:-13 16:-13 17:-13 18:-13 19:-13 20:-13 21:-13 22:-13 23:-13 0:-13 1:-13 2:-13 3:-13 4:-13 5:-13 6:-13 7:-13 8:-13

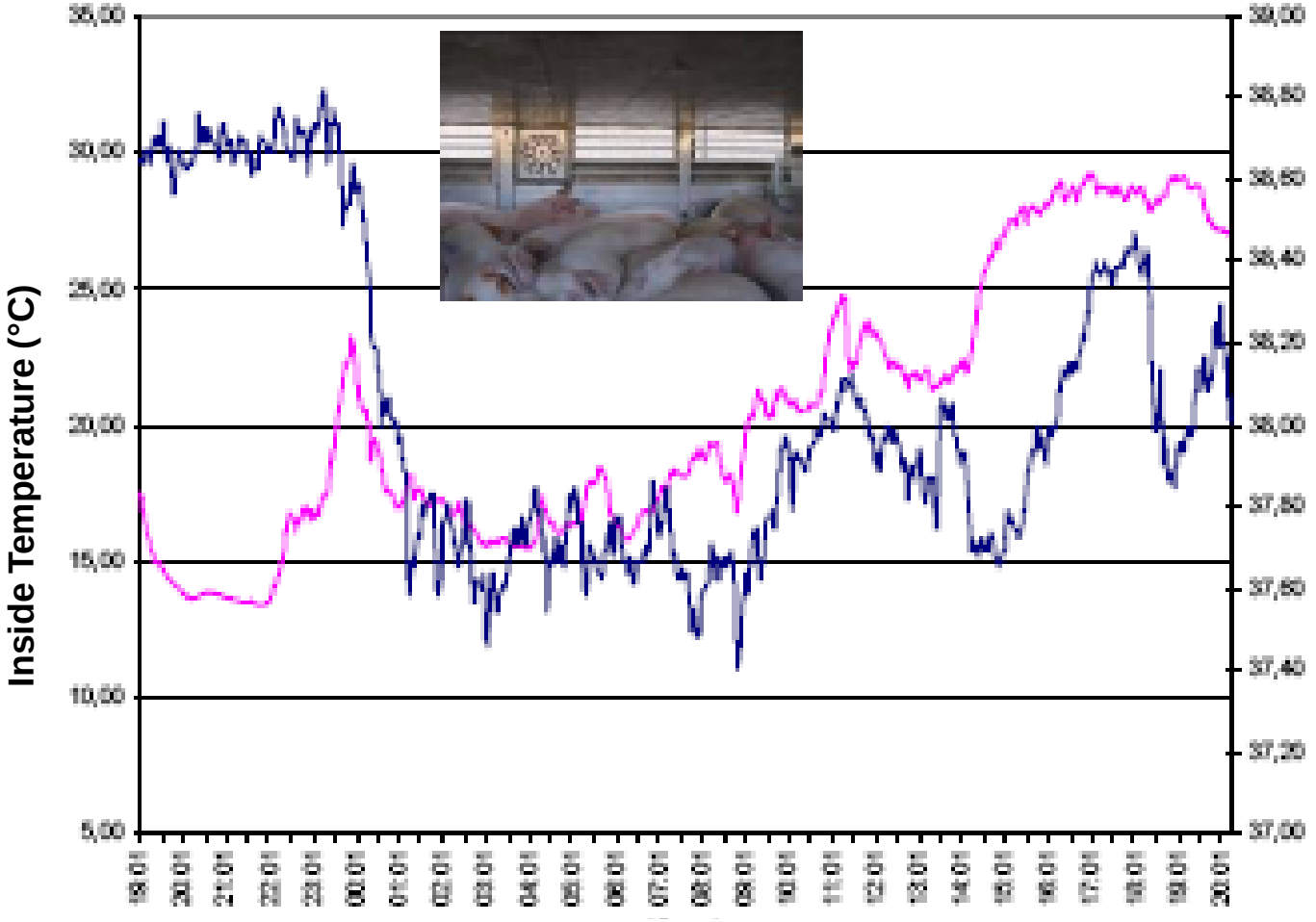
Time

Inside Temperature  Air Flow

# Pig Transport:
# Heart Rate of a Pig

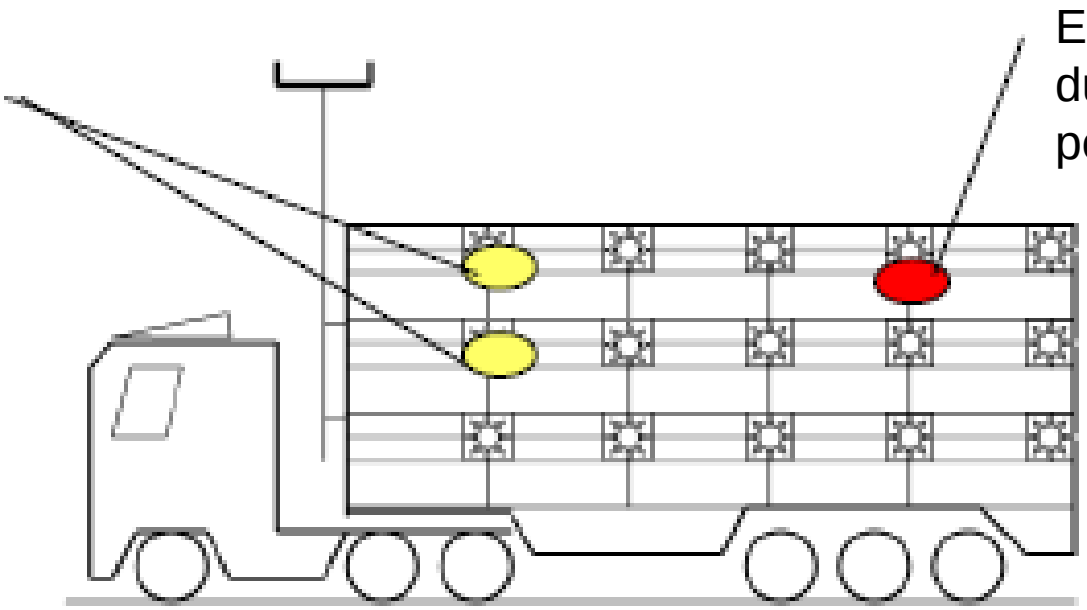


# Pig Transport: Inside Temperatur of Lorry and Body Temperature



# Localisation of extreme temperatures in the Lorry during the transports in the summer

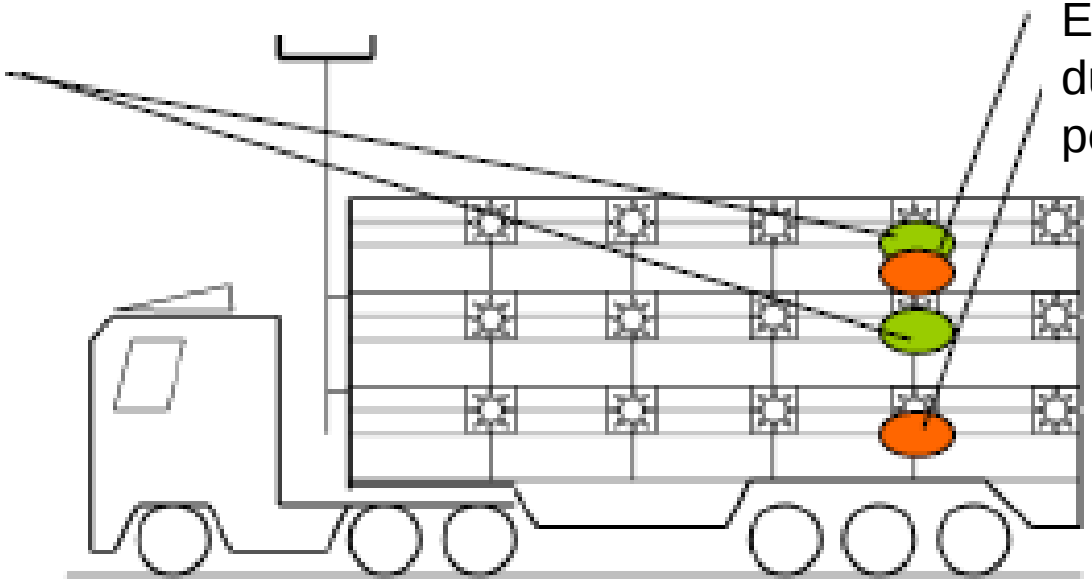
Extreme Values during transport



Extreme Values during parking position

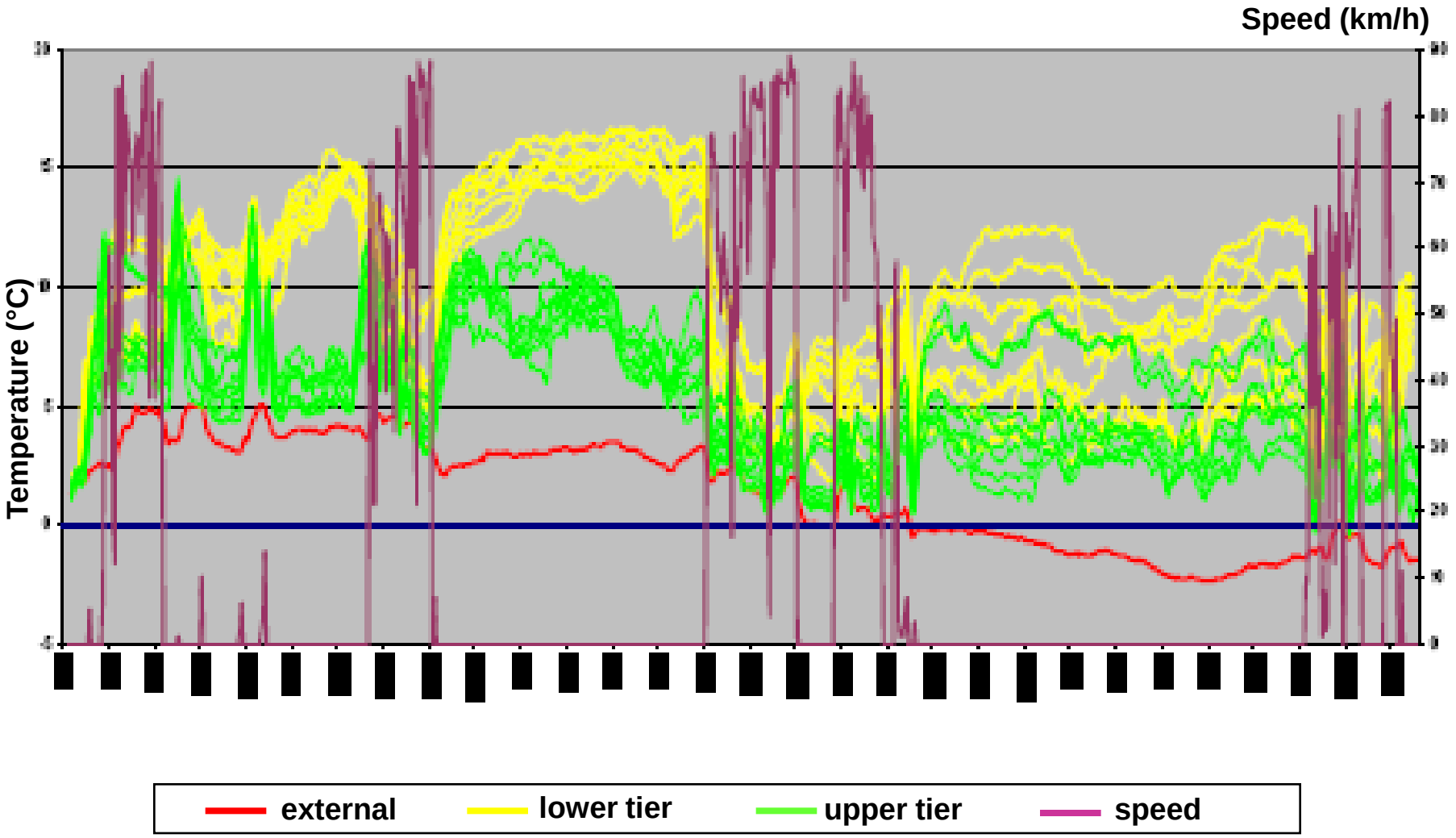
# Localisation of extreme temperatures in the Lorry during the transports in the winter

Extreme Values during transport

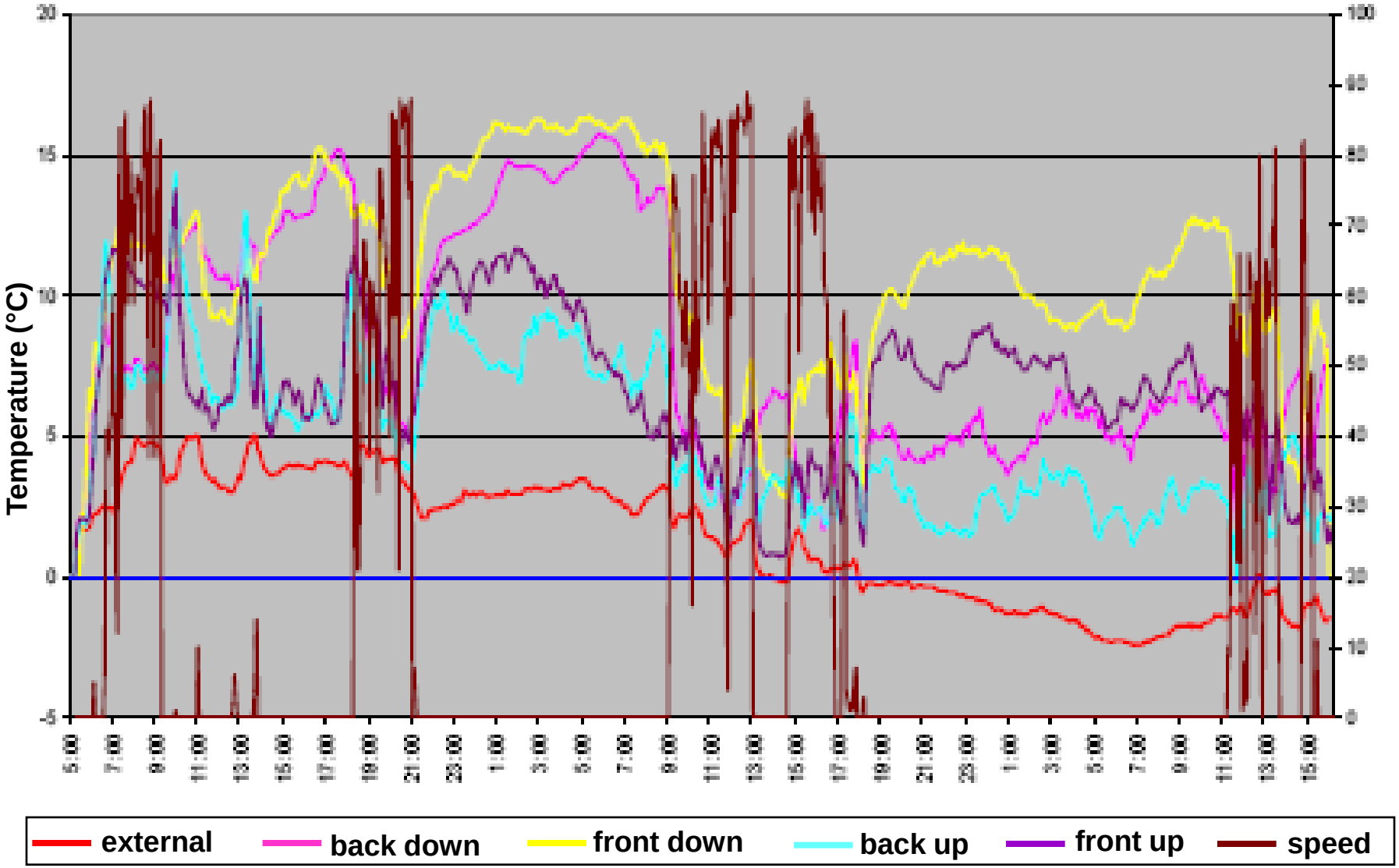


Extreme Values during parking position

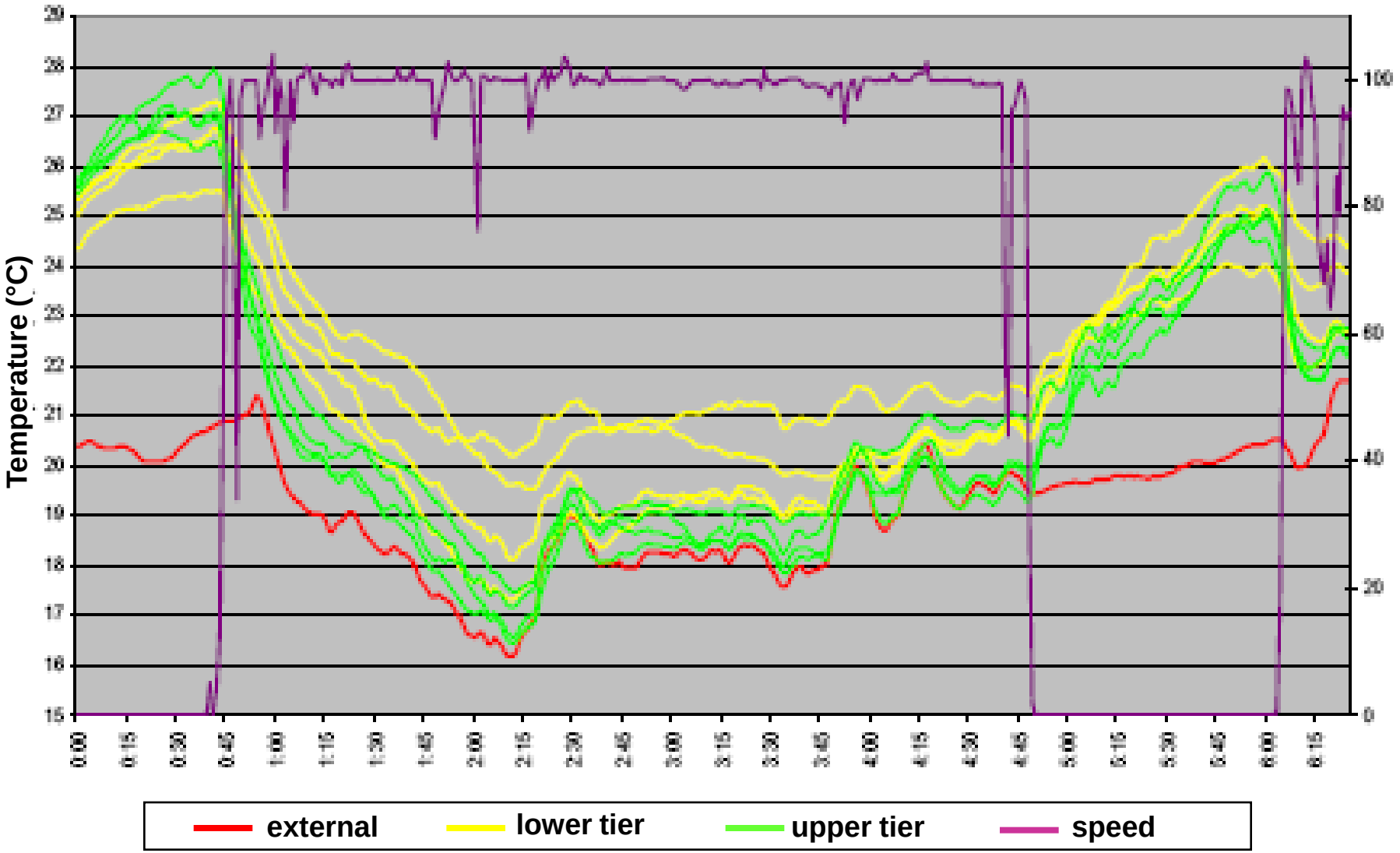
# Cattle Transport:
# Temperatures on upper/lower tier



# Cattle Transport: Temperature and Speed



# Cattle Transport: Temperature and Speed



# Preliminary Conclusion

- High speed driving can reduce animal stress concerning
  - temperature and air movement (inside and body temperature)
  - heart rate
  - behaviour

- Breaks and stop-and-go traffic lead to animal‘s stress

- Technical tools can lead to lower stress factors

→ Statistical analyzes are made at the moment
→ Final report will be ready in Jan 2011

# Acknowlegement

**Project Partners**

- German Federal Research Institute of Animal Health (Friedrich-Loeffler-Institute), Institute of Animal Wellfare and Husbandry, 29223 Celle (Project Management and Coordination)
- University of Veterinary Medicine Hannover, Foundation, Institute of Animal Health, 30559 Hannover

**Industry Partners**

- Zuchtvieh-Export GmbH (ZVE), 34253 Lohfelden,
  Mr. J. Kirch (contractor)
  Spedition Hefter, 53842 Troisdorf-Spich, Mr. M. Hefter
- Viehvermarktungsring Temme Struck, 24891 Thumby-Hassel,
  Mr. T. Struck (contractor)
- Möller Agrarklima GmbH, 49356 Diepholz, Mr. H. Schierbaum (contractor)