

# **Incorporating 'in-game' scenarios into player-surface studies**

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# Introduction

- Gain understanding in the musculoskeletal loading aspect of player-surface interaction
  - Movements
  - In-game scenarios
  - Surface properties

# Introduction

- What do players themselves consider to be important and relevant
  - Movements
  - In-game scenarios
- What surface characteristics do they prefer?

# Method

- Focus group
  - 3 Defensive players
  - 3 Offensive player
- With input and terminology from focus group a questionnaire was made (completed by 58 players)
- In-game scenarios → One-on-one situations

# Method

- Questionnaire
  - First section:
    - Playing position and playing level
    - Experience (natural turf / artificial turf)
    - Exposure (match / training / recreational)
  - Second section:
    - 17 movements (importance / frequency / loading)
    - 6 one-on-one situations (frequency / loading)

# Method

- Questionnaire
  - Third section:
    - Surface preferences
    - Rating of Loughborough University artificial pitches
  - Fourth section:
    - Mindset about different surfaces

# Method

- Loughborough University pitches

Pitch	Pile	Infill Depth	Sand	Rubber	Shockpad	Base
PEC	61mm	40-50mm	10mm	30-40mm	None	Bound Asphalt
EHB	35mm	25mm	10mm	15mm	25mm	Bound asphalt

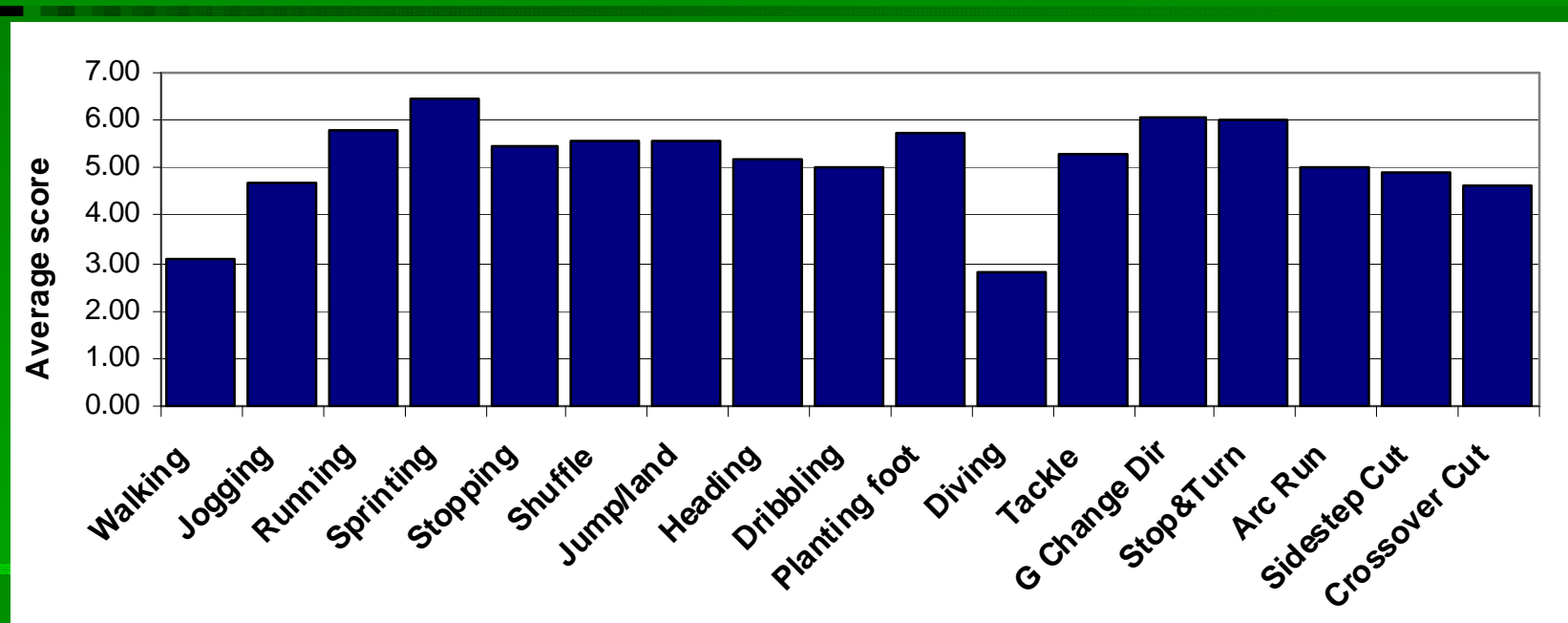


# Results

- Focus group: Top 5 movements
  - 1: Change of direction
  - 2: Straight line running / sprinting
  - 3: Sidesteps / shuffle
  - 4: Jump / Land
  - 5: Stopping

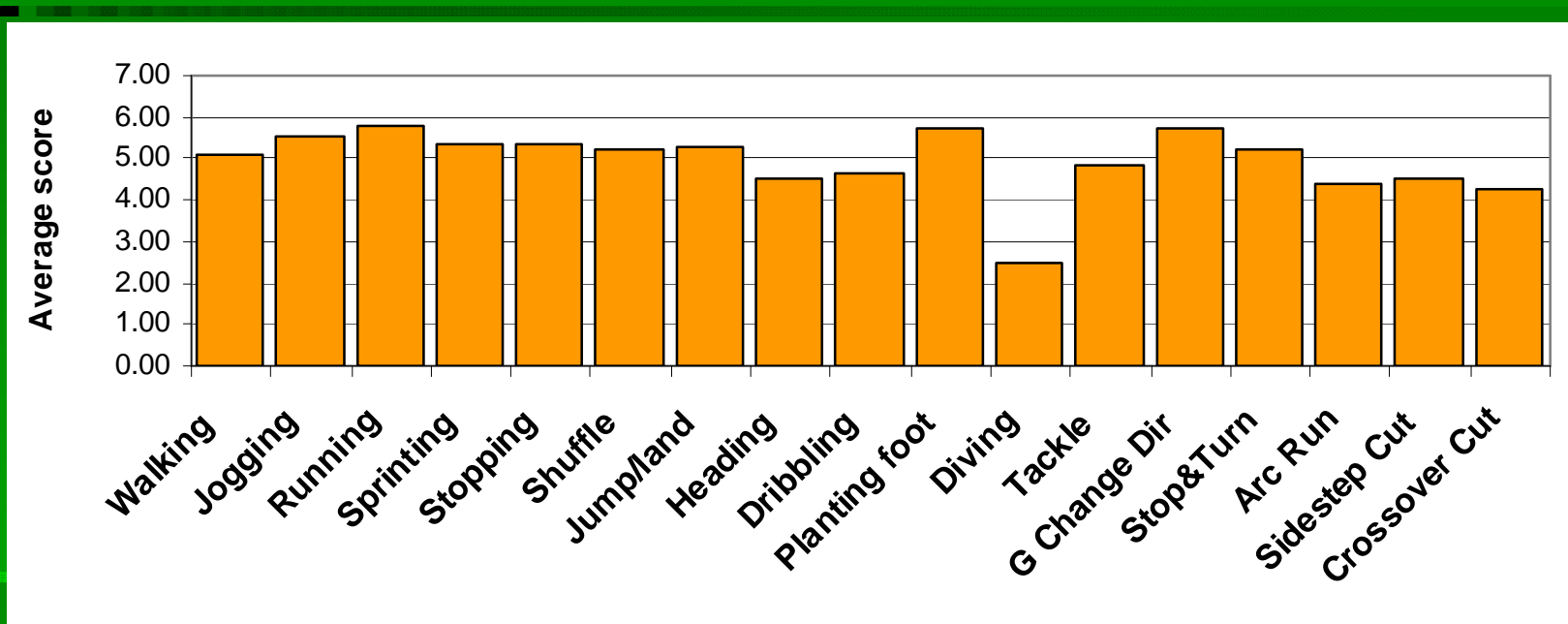


# Results



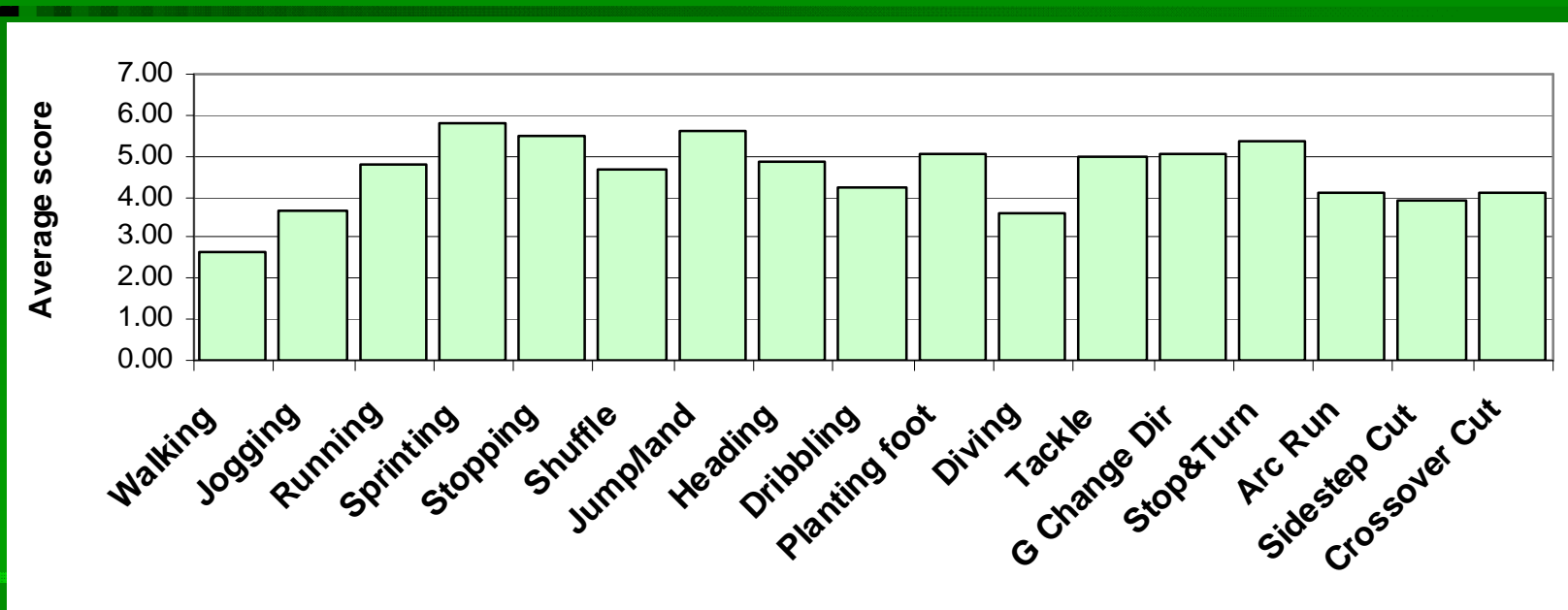
Importance

# Results



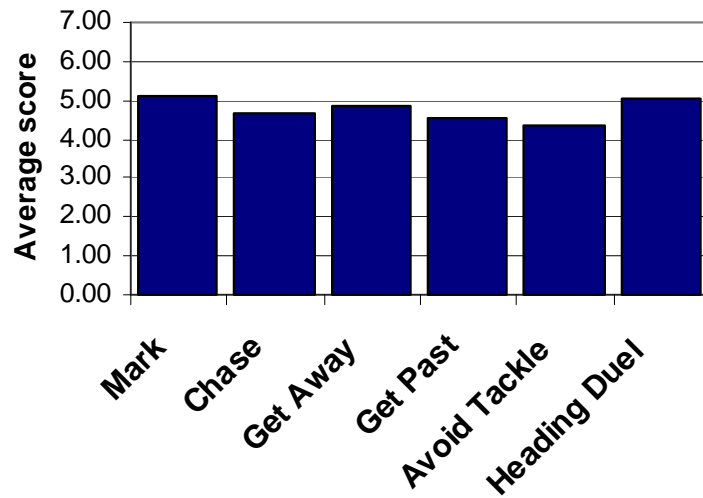
Frequency

# Results

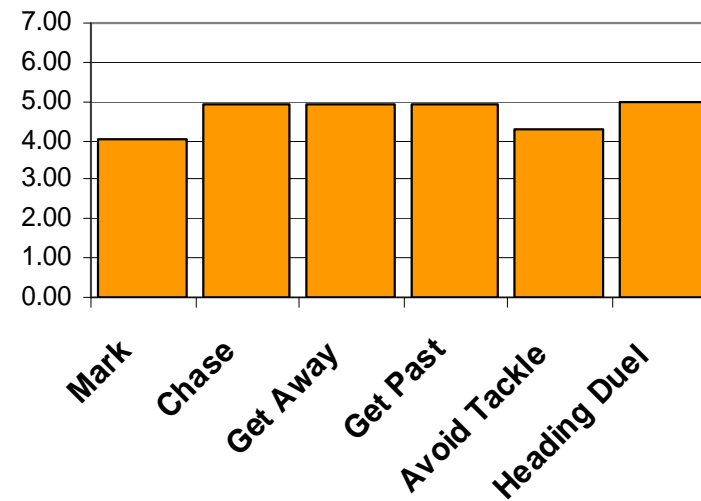


Musculoskeletal loading

# Results

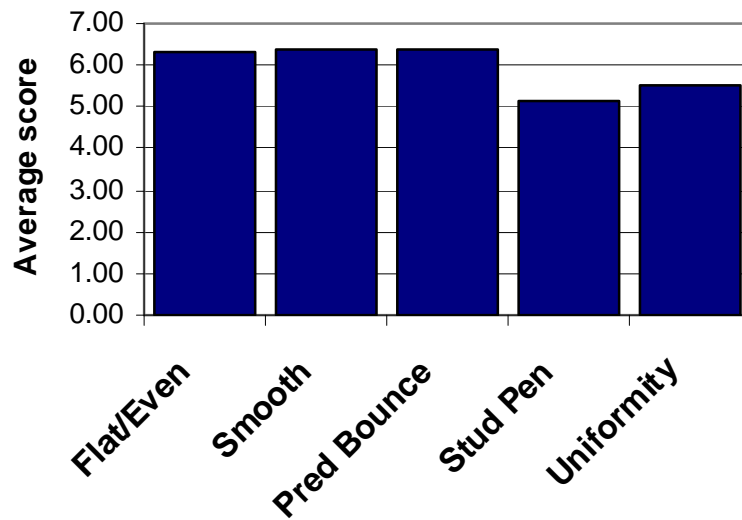


Frequency

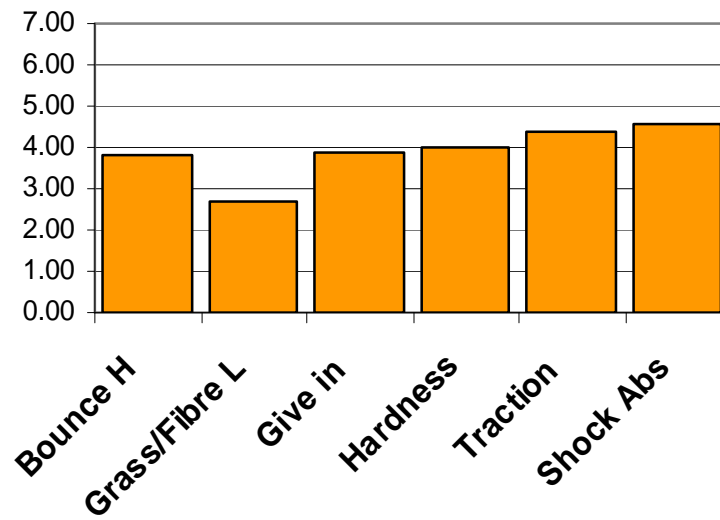


Loading

# Results

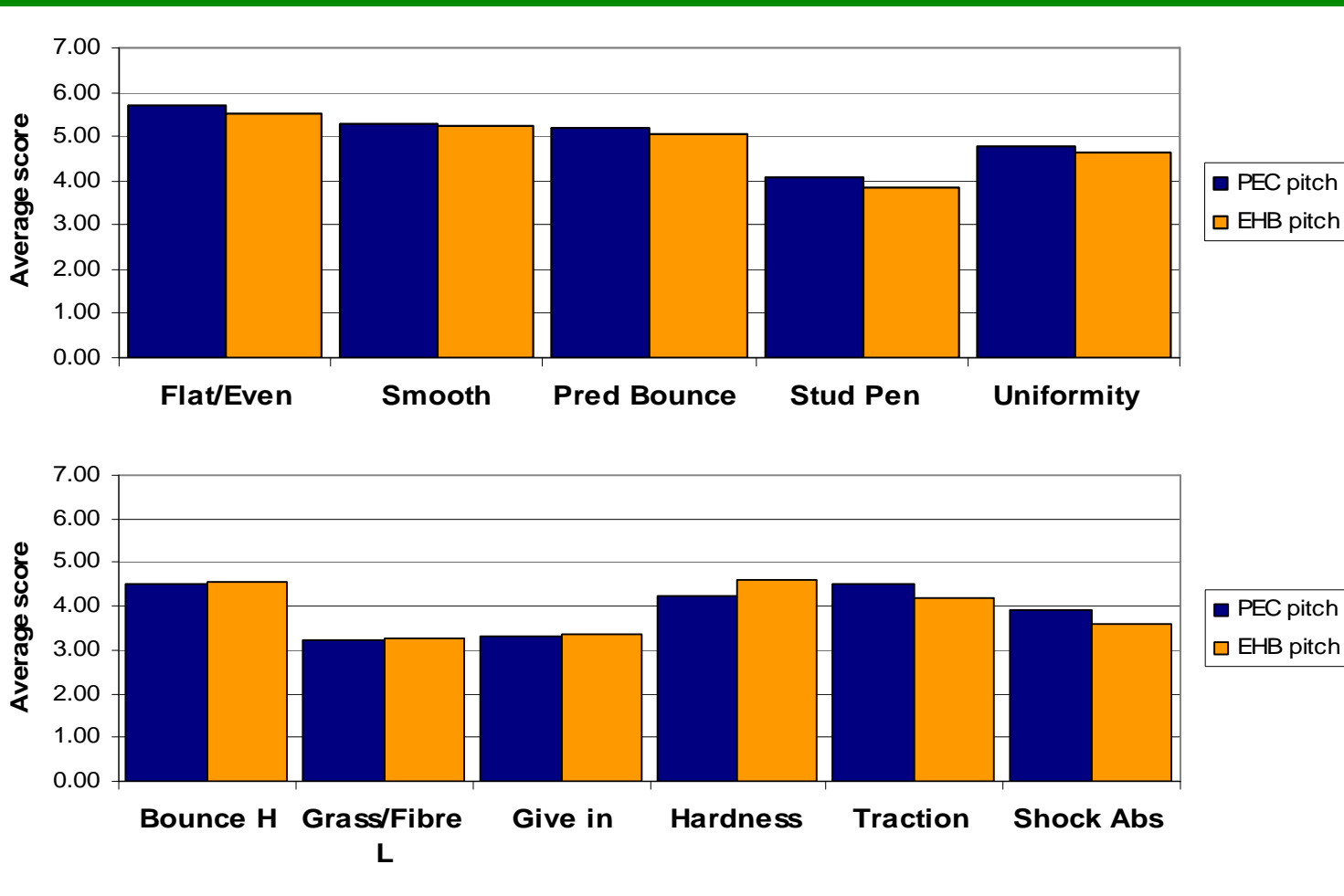


Importance

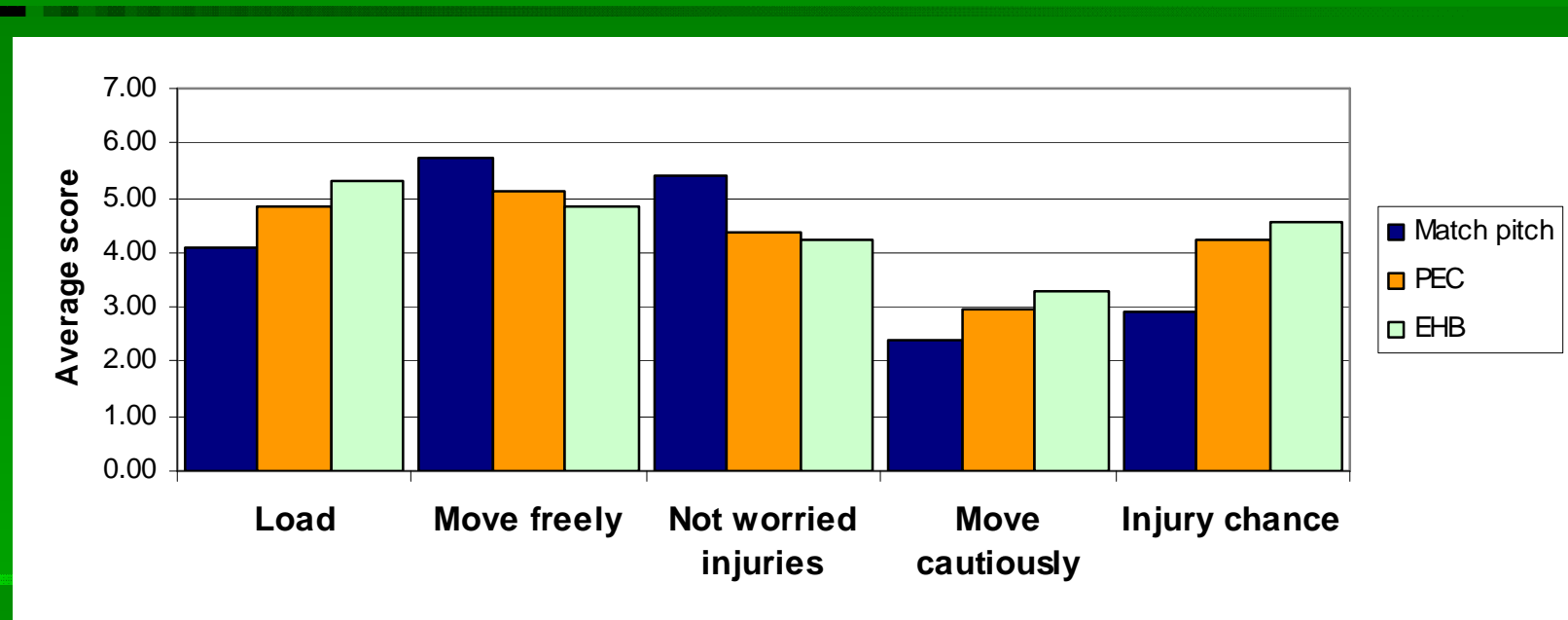


Preference

# Results



# Results



# Results

- Effect playing position
  - Heading (importance / frequency)
  - Dribbling (frequency)
  - Tackle (importance)
  - Arc run (importance / frequency)
  - Crossover cut (importance / frequency)



# Results

- Effect playing position
  - Mark opponent (frequency / loading)
  - Chase opponent (frequency / loading)
  - Get away from opponent (frequency)
  - Get past opponent (frequency)
  - Avoid tackle (frequency)
  - Heading duel (frequency)

# Results

- Effect playing level
  - Planting non-kicking foot (frequency)
  - General change of direction (importance/frequency)
  - PEC pitch
    - Smooth
    - Stud penetration
- Mindset
  - Loading match pitch
  - Injury chance match pitch

# Discussion

- 'Sprinting', 'a general change of direction' and 'stop & turn' were rated the highest for loading as well as in the importance or frequency category
- 'Stop & turn' was rated the higher in each category than other changes of direction

# Discussion

- One-on-one situations were all rated similarly
- Playing position had a significant effect on all one-on-one situations
- Heading and heading duels rated higher by defenders and forwards

# Discussion

- The EHB pitch scored the highest in terms of loading
- The lower traction, lower shock absorption and harder surface ratings than the PEC seem to suggest these are the key parameters that affect the loading
- Difference in rated hardness was not confirmed by previous measurements

# Conclusions

- Multiple movements are rated highly for
  - Importance
  - Frequency
  - Loading
- Playing position can have a significant effect on how players rate
  - Movements
  - One-on-one situations

# Conclusions

- Differences between the two artificial pitches indicated that the following properties are responsible for differences in ratings on musculoskeletal loading
  - Traction
  - Hardness
  - Shock absorption

# Recommendations

- Future studies
  - Different types of movements
  - Different one-on-one situations
  - Different surface characteristics with a varying range of
    - Traction
    - Hardness
    - Shock absorption



# Recommendations

- Future studies
  - Playing position and playing level of players should be considered carefully
  - Surface properties should be measured at the same time as the test

**Thank you**

Questions?