Cattle handling injuries
Underlying causes and prevention

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Central Denmark Region

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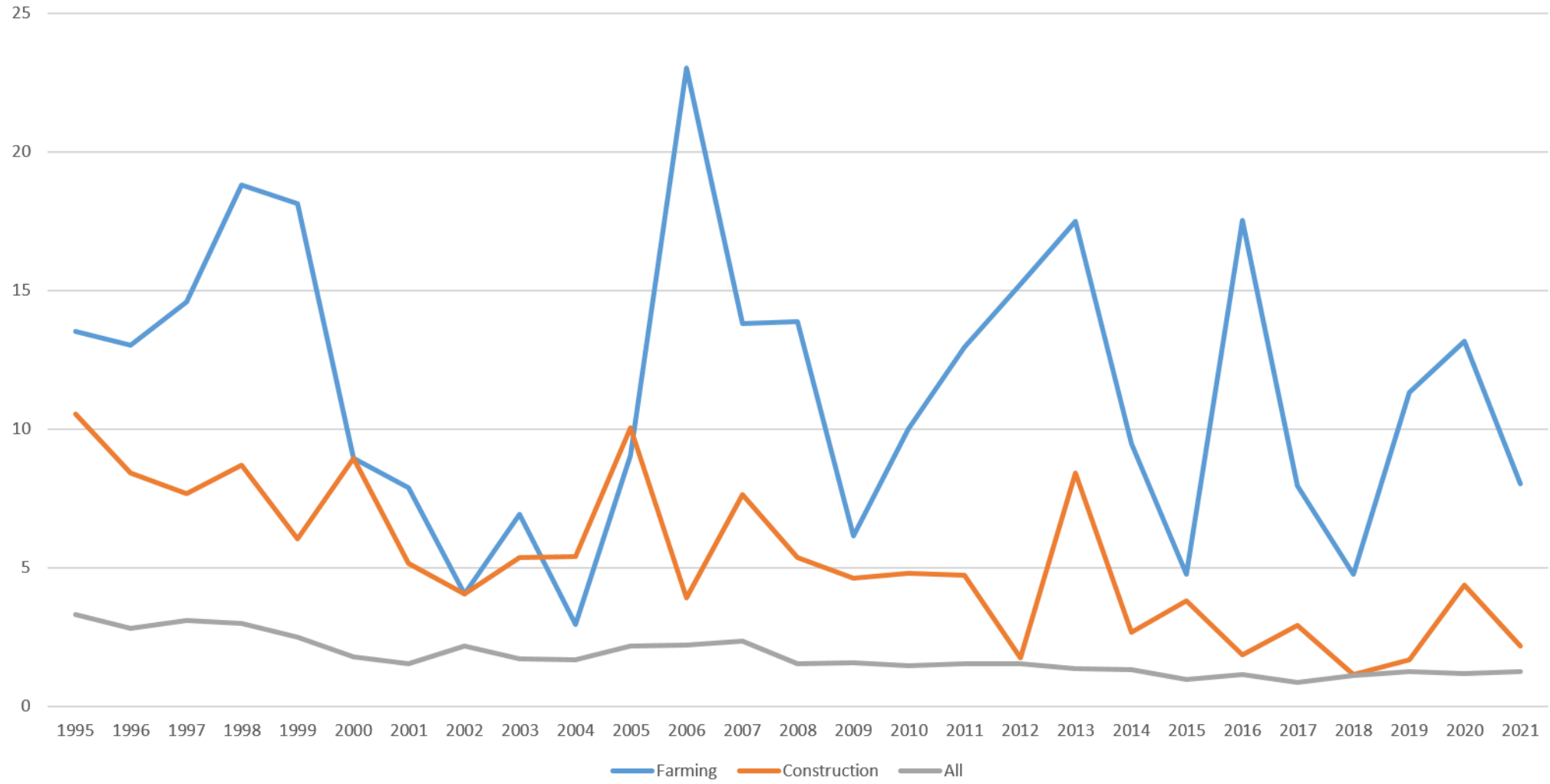
Who am I?

- Psychologist
- Department of Occupational Medicine, Goedstrup Hospital (prev. Herning Hospital), Denmark
- Done research on prevention of occupational injuries since 2001.
  - Wood, metal and iron industry
  - Construction sector
  - Agriculture
- Leadership, safety culture & climate

What am I going to talk about?

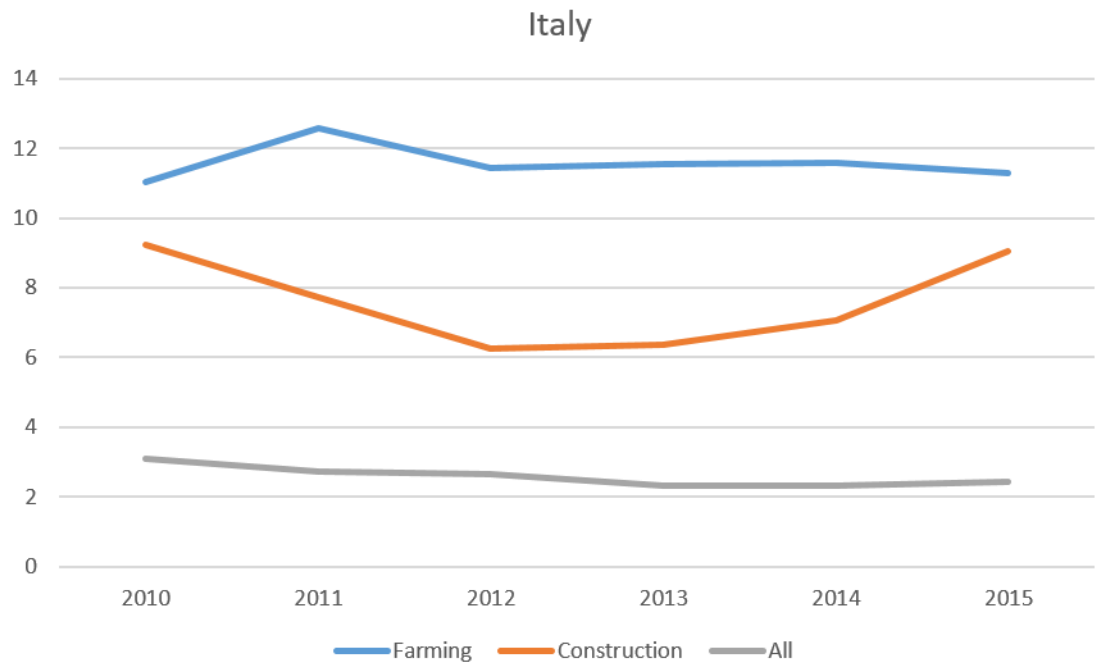
- Injuries in farming and known risk factors
- Prevention of injuries in farming
- Underlying causes of cattle handling injuries

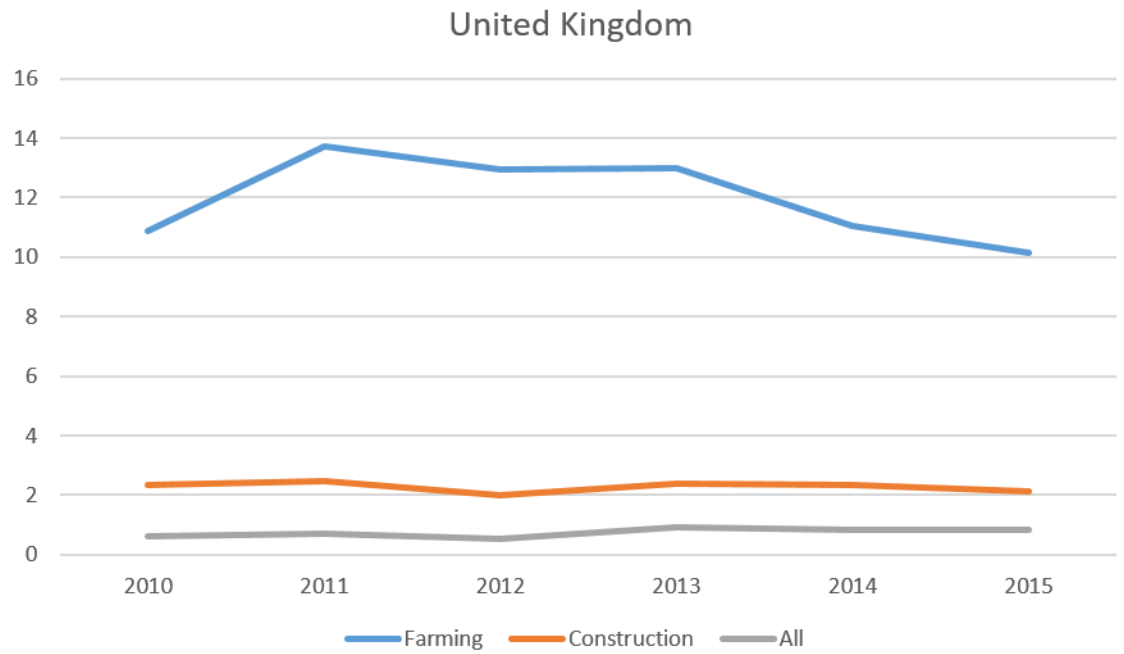
Fatal injuries in DK per 100.000 workers



Danish Work Environment Authorities

Fatal injuries per 100.000 workers





ILOSTAT 2022

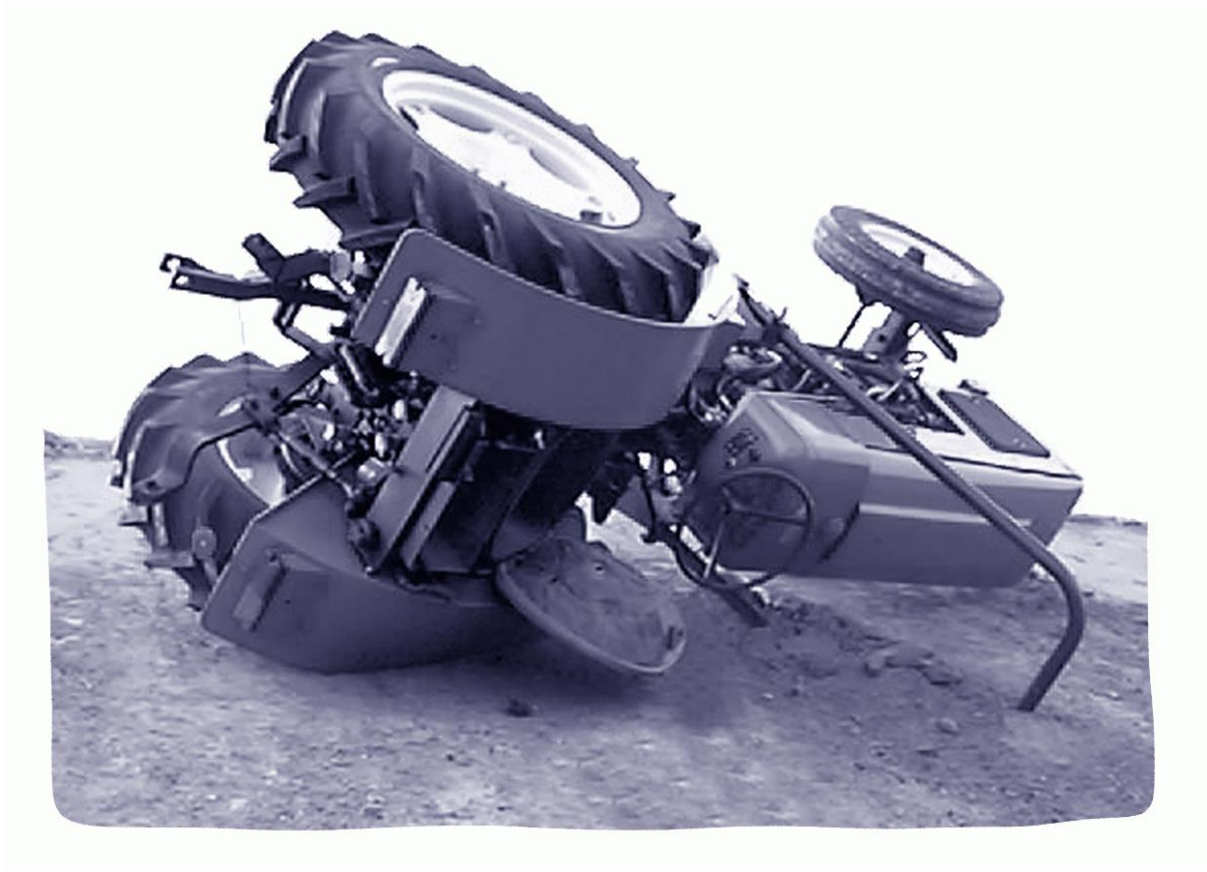
Risk factors for agricultural injuries

- Demographics
  - Older age
  - Male
  - Education (high school or more)
  - non-Caucasian
  - Language (Finnish vs. Swedish)
  - Living on the farm
  - Full-time farmer
  - Owner/operator of farm
- Personal or behavioral
  - Sleeping < 7-7,5 hours
  - Stress or depression
  - Hearing loss
  - Regular medication use
  - Challenging social conditions
- Farm-related
  - Greater farm sales
  - Income
  - Higher number of workers
  - Computer use for farm management
  - Livestock
  - High cooperation between farms
- Safety-related
  - Prior injury
  - Unsafe practices conducted
  - High percieved injury risk
  - Exposure to pesticides or chemicals
  - Poor maintenance of machinery

Jadhav et al 2015 & 2016

Prevention of injuries in agriculture

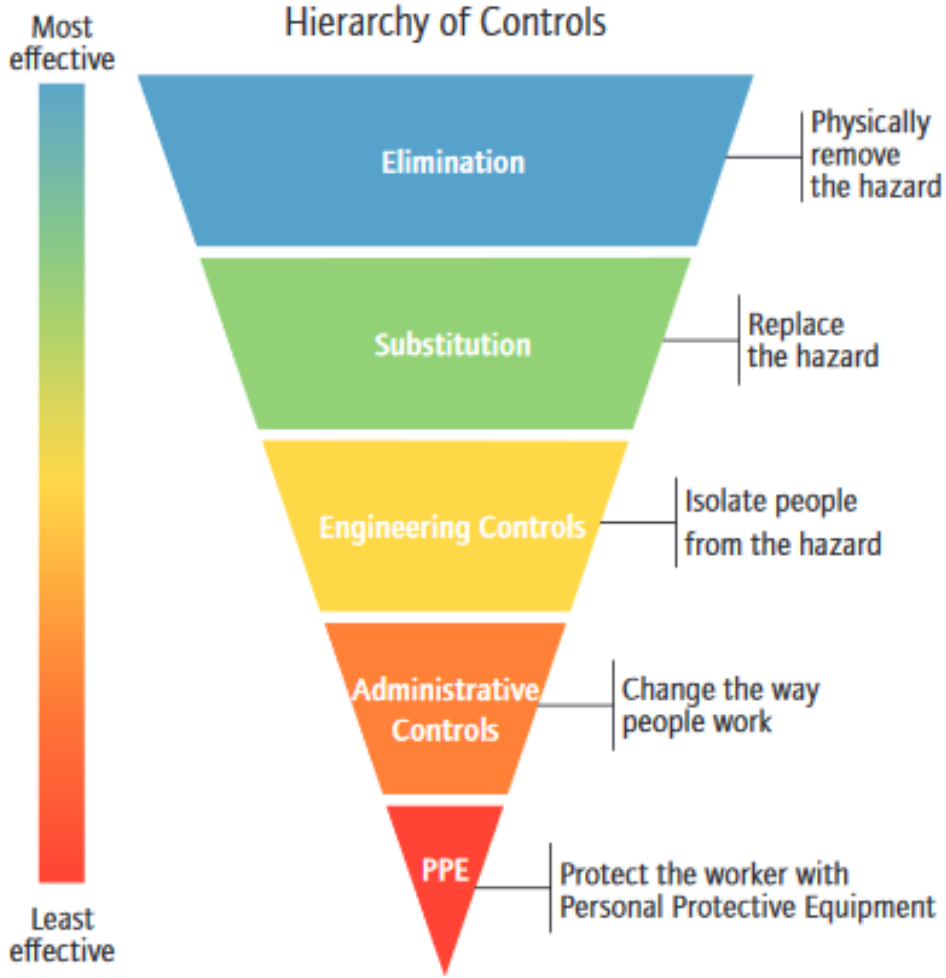
- No evidence that educational interventions are effective in decreasing injury rates
- Financial incentives (insurance discounts) could reduce injury rates
- Legislation to ban pesticides could be effective
- Legislation expanding the use of safety devices (ROPS) on new tractors was associated with a decrease in fatal injuries



Rautiainen et al 2008

Prevention of occupational injuries

- More effective interventions eliminate risk at the source of the hazard through engineering solutions or the separation of workers from hazards
- Less effective behavioral approaches (e.g. safety training) were often directed at the prevention of all workplace injuries without explicitly addressing specific hazards.
- Regulation and enforcement: relatively modest effects, but potential large population-based effects.



Dyreborg et al 2022

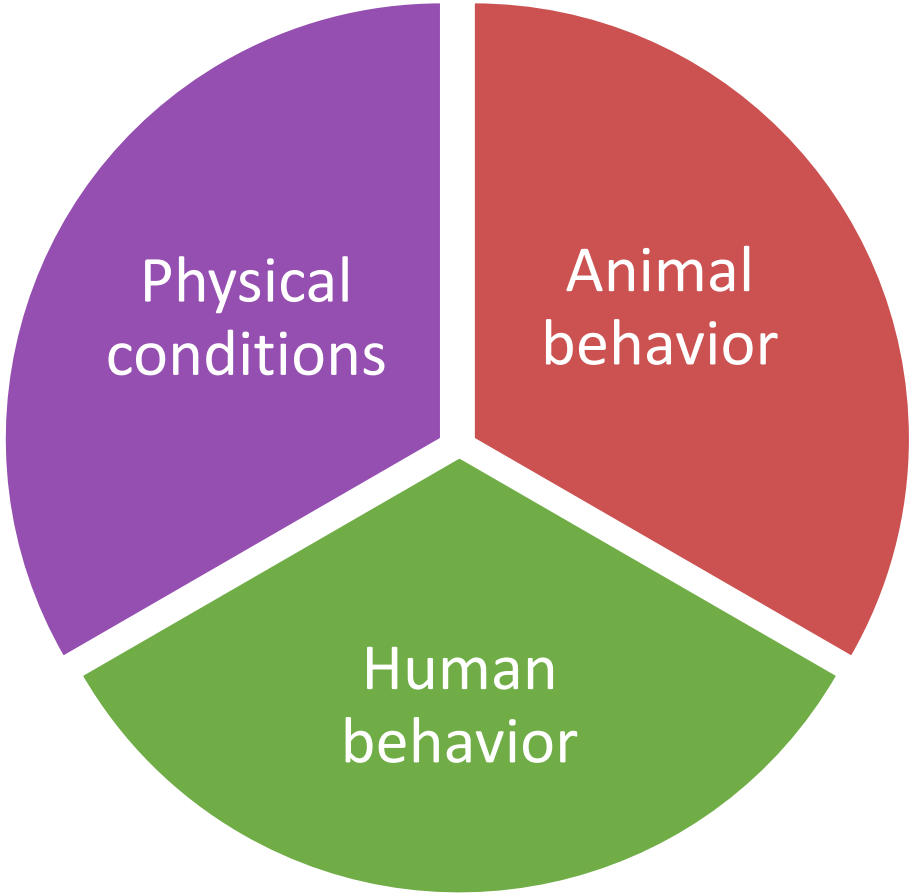
Injury profile of Danish agriculture

- Subbranches with the most serious injuries (>3 weeks absence)
  - Dairy farms
    - Animal handling (42%)
    - Machine related injuries (19%)
    - Falls from heights (13%)
  - Crop production
    - Falls, slips and trips (26%)
    - Machine related injuries (26%)
  - Pig farming
    - Animal handling (27%)
    - Falls, slips and trips (16%)
    - Falls from heights (11%)

Danish Work Environment Authorities 2016

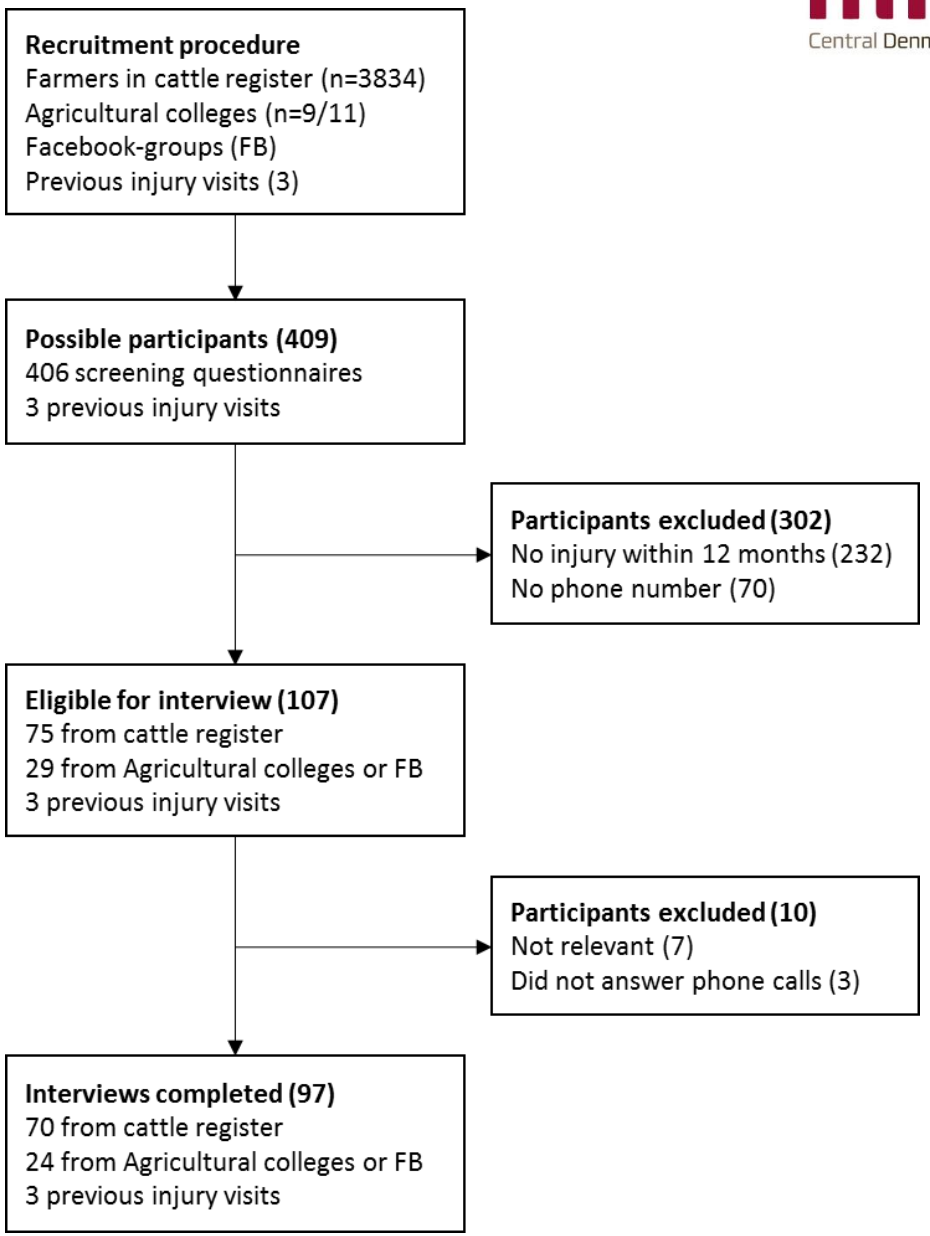
How to prevent cattle handling injuries?

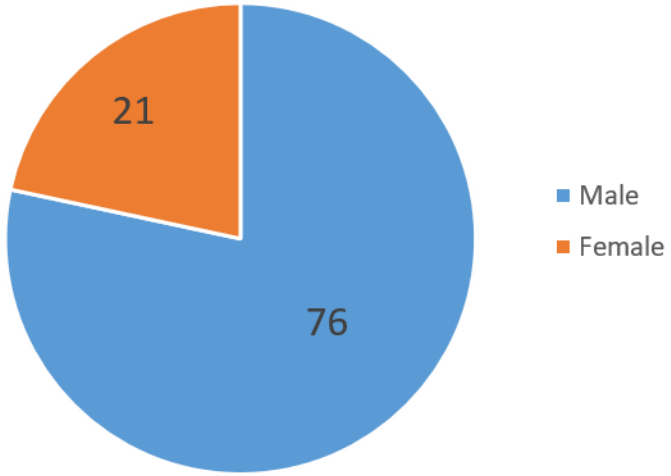
- We know the direct causes: kicks, crushed, attacks
- We need to know more about the underlying causes: why, when, where?

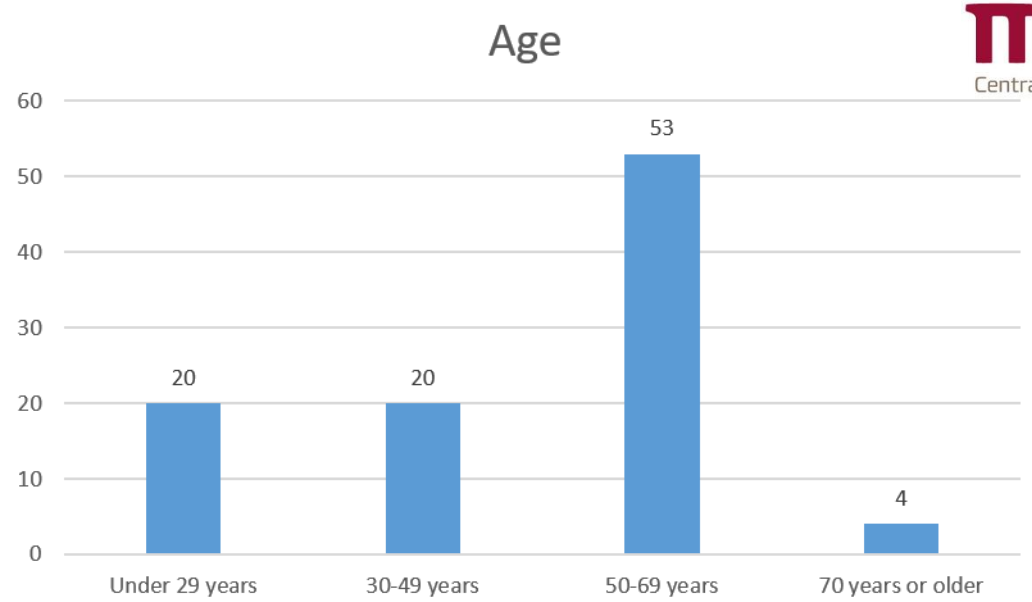


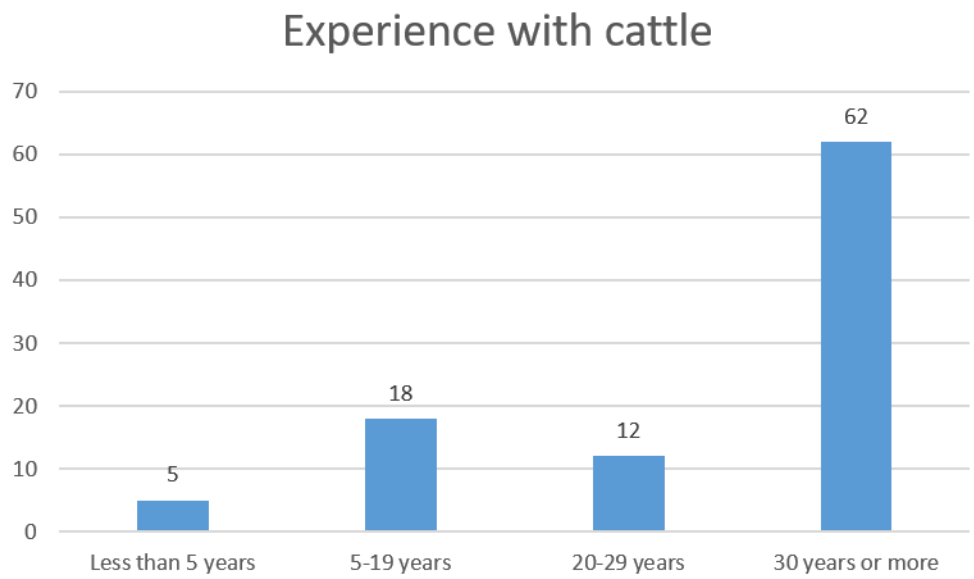
Method

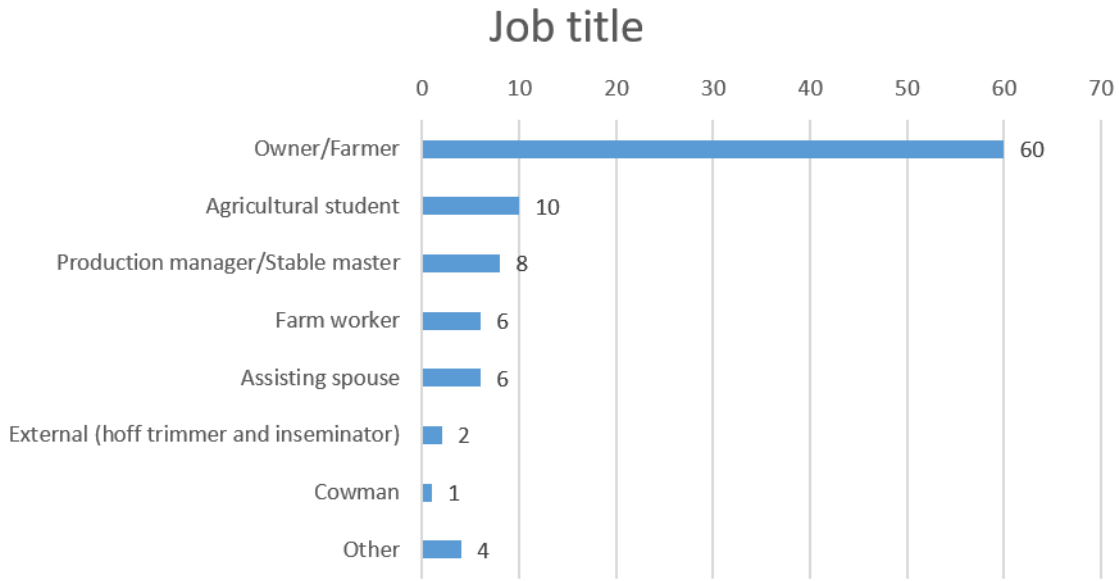
- Structured interviews with 97 injured farmers
- Focus on
  - Injury incident
  - Physical conditions
  - Animal behavior
  - Human behavior
- Analyzed by a safety researcher and agricultural work environment advisor to identify possible preventive actions

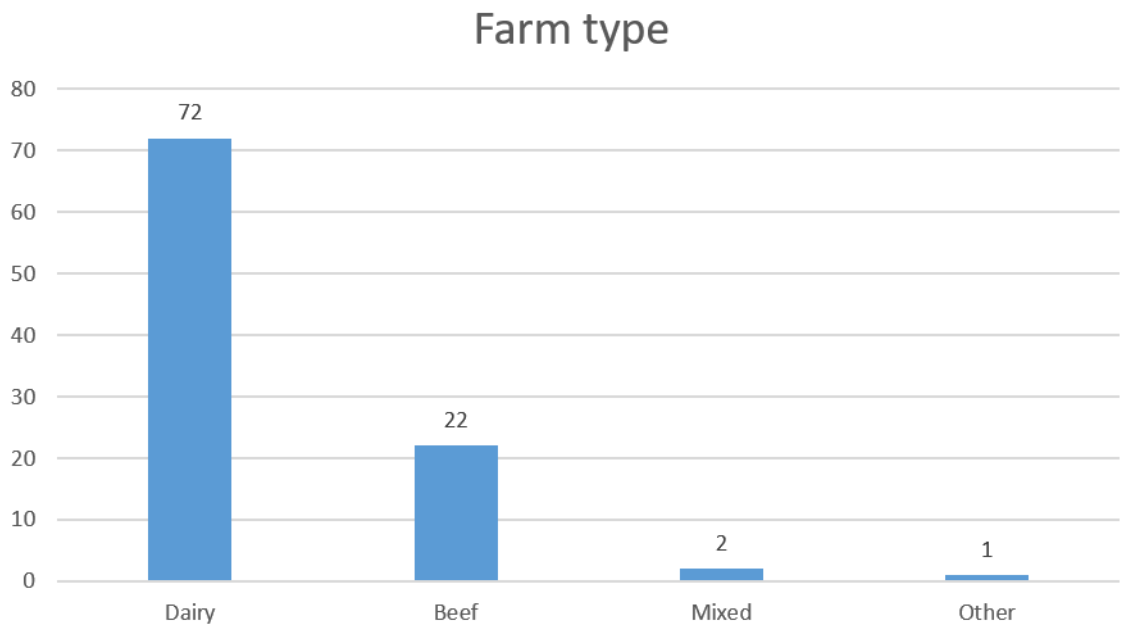


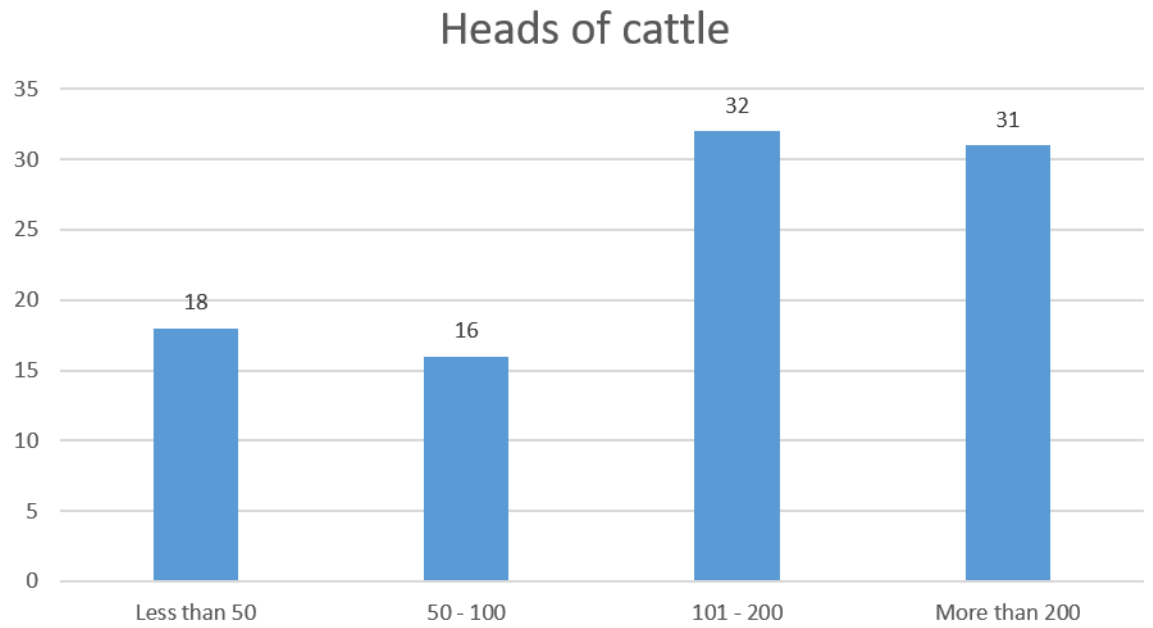

21
76
Male
Female


Age
60
50
40
30
20
10
0
20
20
53
4
Under 29 years
30-49 years
50-69 years
70 years or older

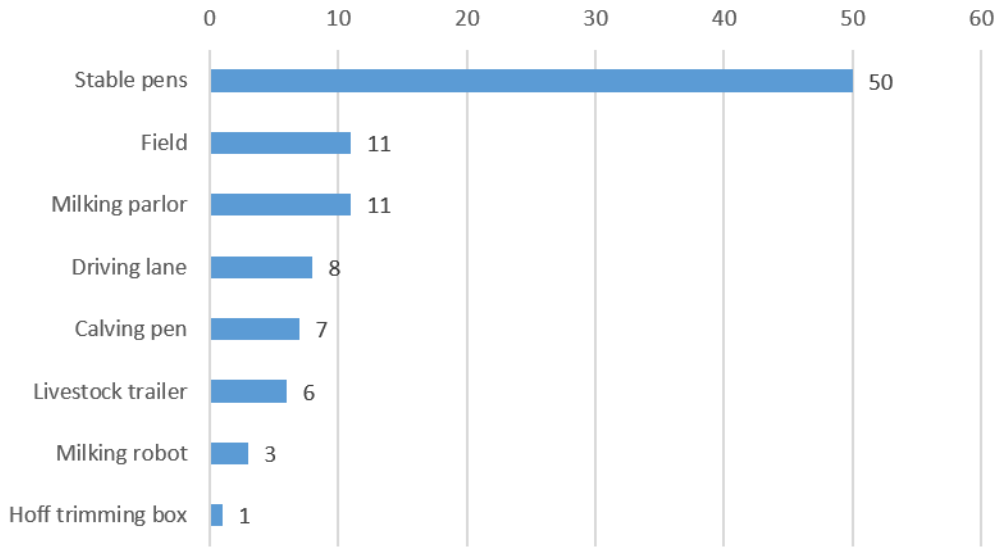

Experience with cattle
70
60
50
40
30
20
10
0
5
18
12
62
Less than 5 years
5-19 years
20-29 years
30 years or more


Job title
0
10
20
30
40
50
60
70
Owner/Farmer
60
Agricultural student
10
Production manager/Stable master
8
Farm worker
6
Assisting spouse
6
External (hoff trimmer and inseminator)
2
Cowman
1
Other
4

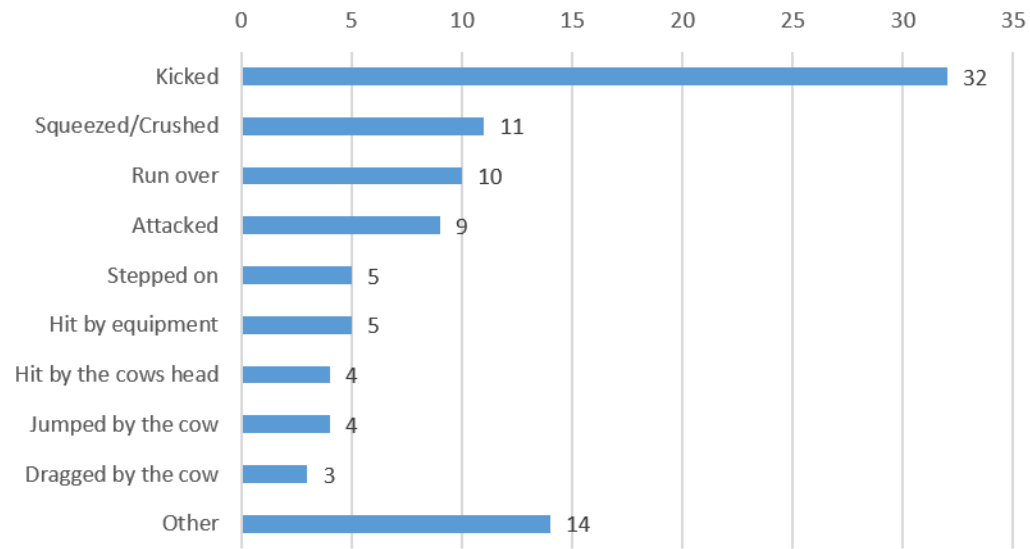

Farm type
80
70
60
50
40
30
20
10
0
72
22
2
1
Dairy
Beef
Mixed
Other


Heads of cattle
35
30
25
20
15
10
5
0
18
16
32
31
Less than 50
50 - 100
101 - 200
More than 200

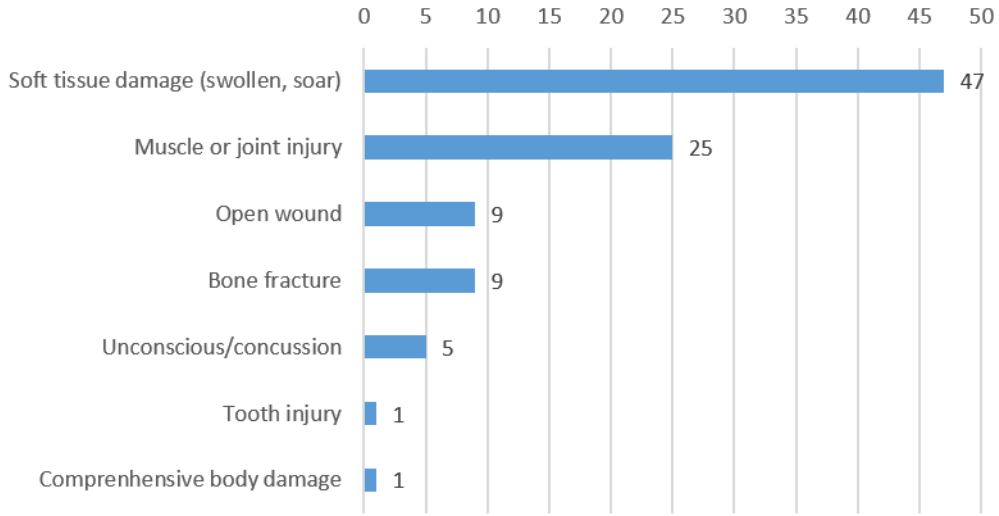
Place of incident



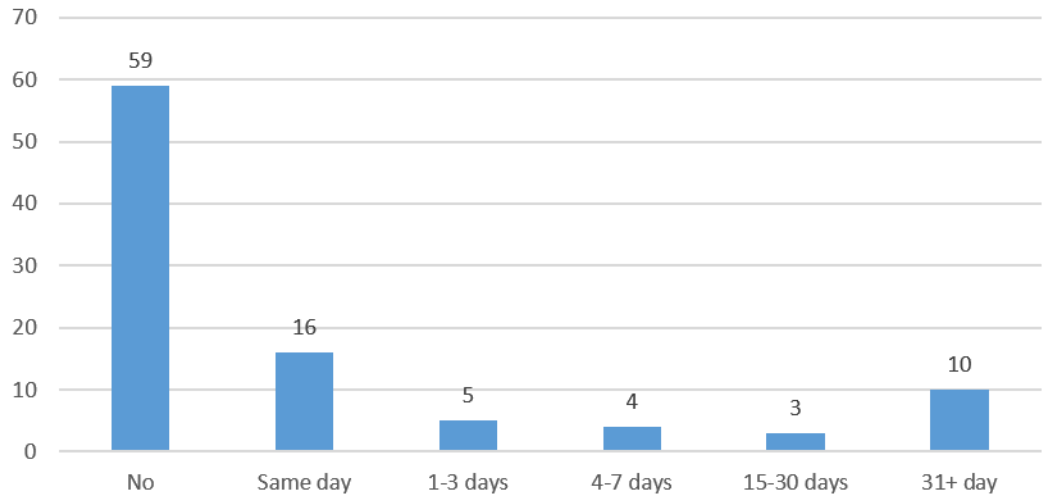
Type of incident



Type of injury



Absence

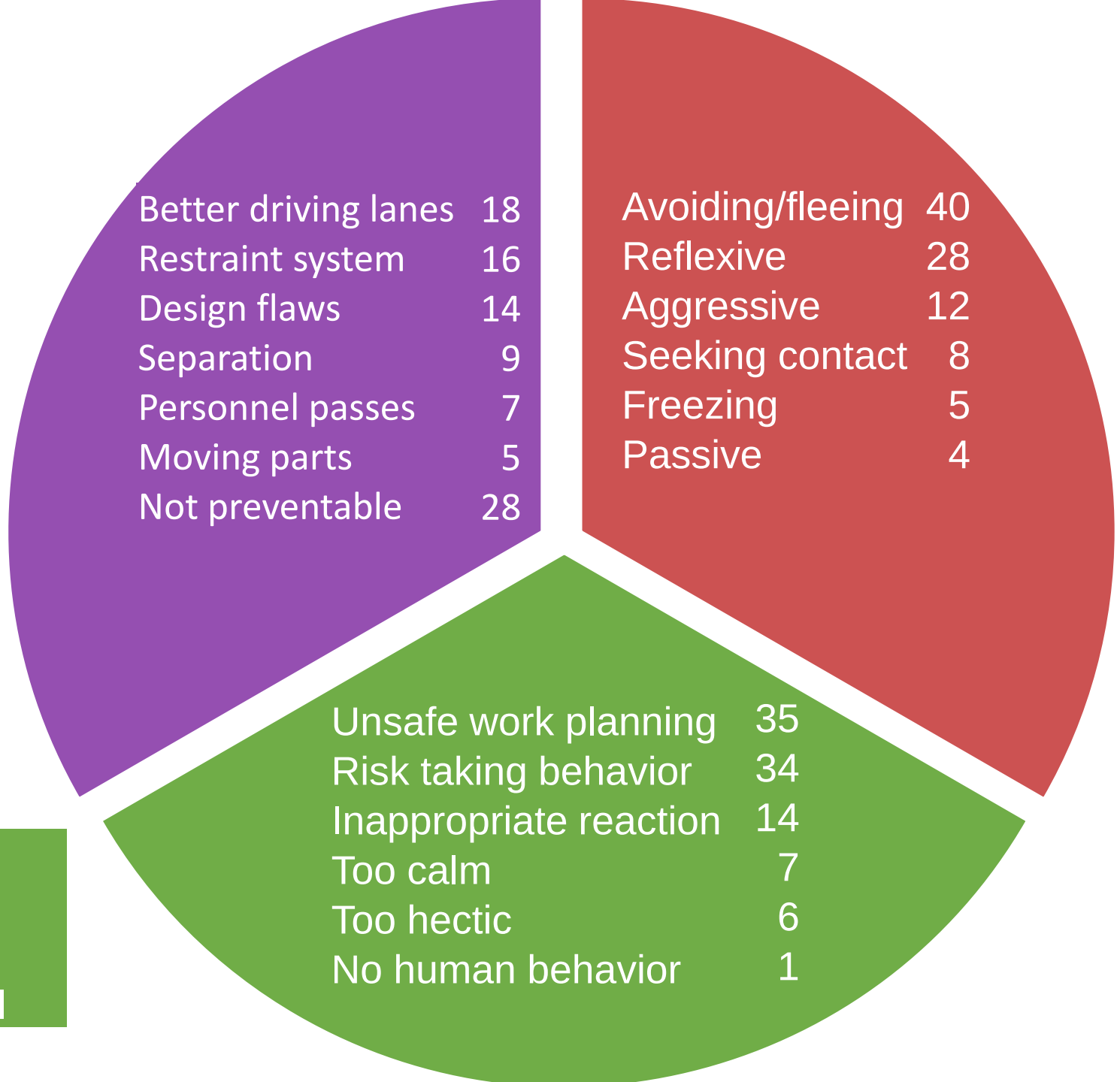


Example of an injury

They are moving cows to hoof trimming. They move them from the stable to the hoof trimming chute through a 4 meters wide driving lane. They use a 3 meters wide gate to push the cows forward with and have separated 3 cows in front of the gate. They want to include 2 extra cows, that are behind the gate. He turns around to find the 2 extra cows. At the same time one of the cows in front of the gate turns around and tries to flee. The cow sees the hole in the gate and runs into it. He has a hand on the end of the gate, which turns forcefully as it is hit by the cow. He tears a muscle in his biceps and still has his arm in a sling.

Animal behavior: Avoiding/fleeing (hoof trimming)
Physical conditions: Better driving lanes
Human behavior: Unsafe work planning

Stable layout
Available space
Floor
Sounds
Maintenance

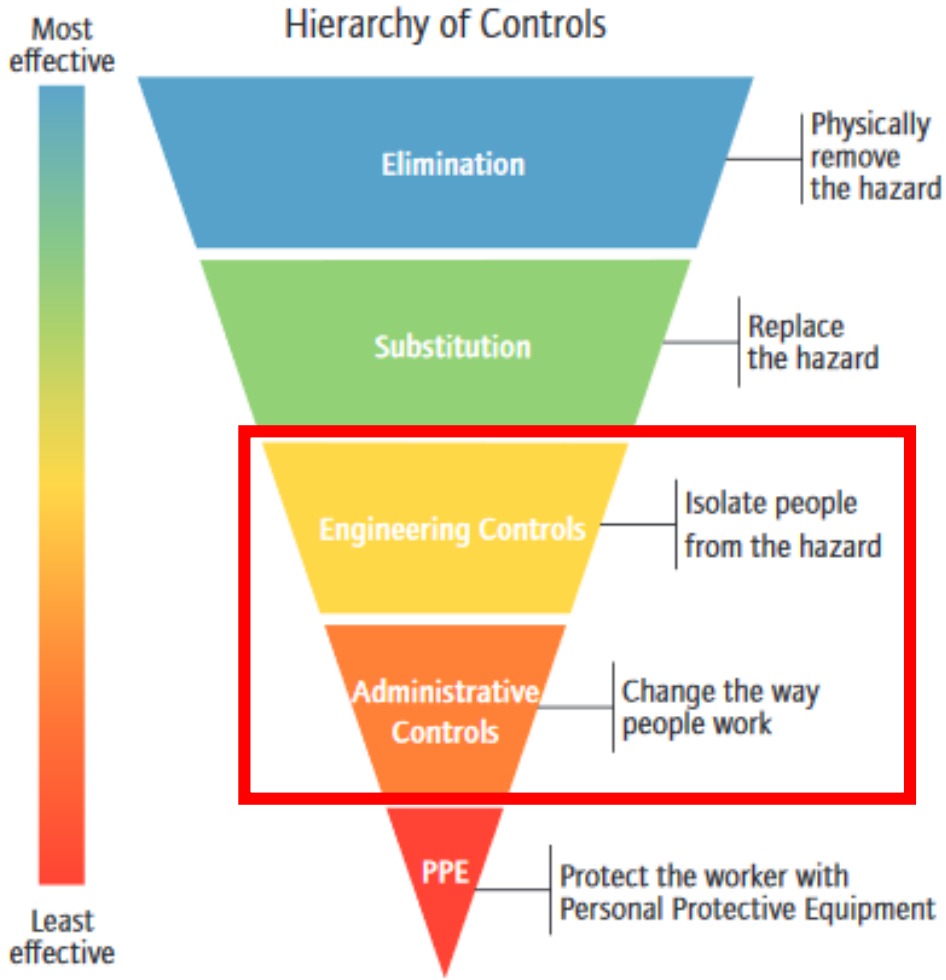


Known temper issues
Stressed/frightened
Novel situation
Danger signs

Risky work task
Took a risk
Close to animal
Touching animal

Conclusion

- Great potential for preventing cattle handling injuries by improving the physical conditions (70%) and work planning (34%), to better take human and animal behavior into account
  - Improve layout
  - Develop safer gate designs
  - Develop energy-absorbing fence and wall structures
  - Improve stockmanship and work planning



Thank you!

Questions?

Project funded by the Danish Work Environment Research Fund

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