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Does the automation level of a dairy farm affect animal welfare?

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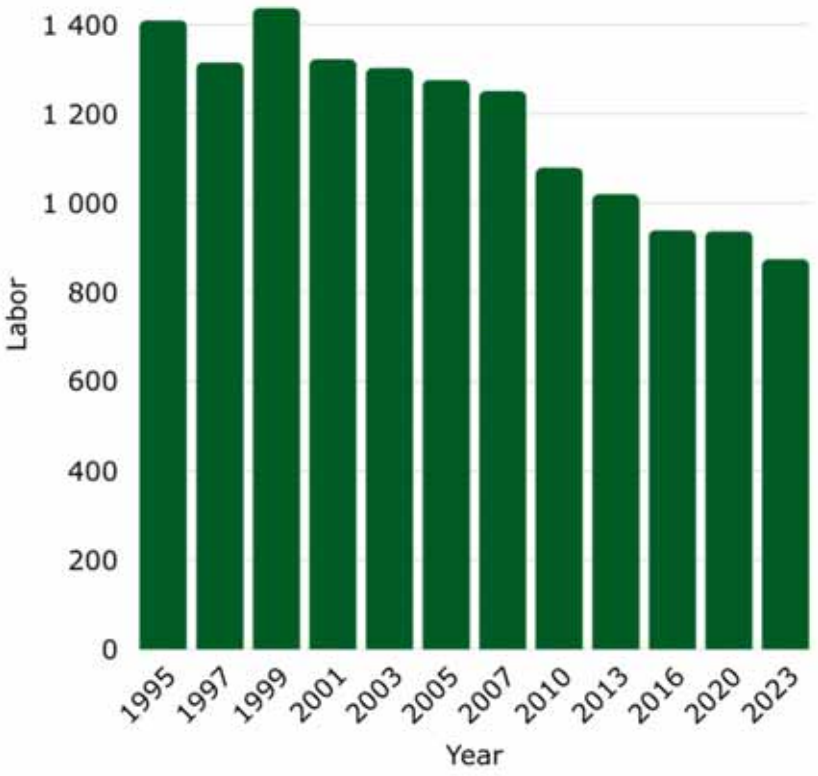
Challange



Federal Statistical Office of Germany, 2024

- dairy farming requires substantial human labor
- processes like milking, feeding, manure removal and bedding have been automated
- reduce labor demands and flexibility
- knowledge gap about influence on animal welfare

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Aim

- developement of a classification system to categorize dairy farms into varying automation level

- investigation whether the automation level of a dairy farm affect animal welfare

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Farms and Animals

- 32 farms in north and central Germany
- investigation period: 10/2023-04/2024
- including crieterias:
  - German Holstein cows
  - loose housing systems with lying cubicles
  - no pasture access
  - conventional farming

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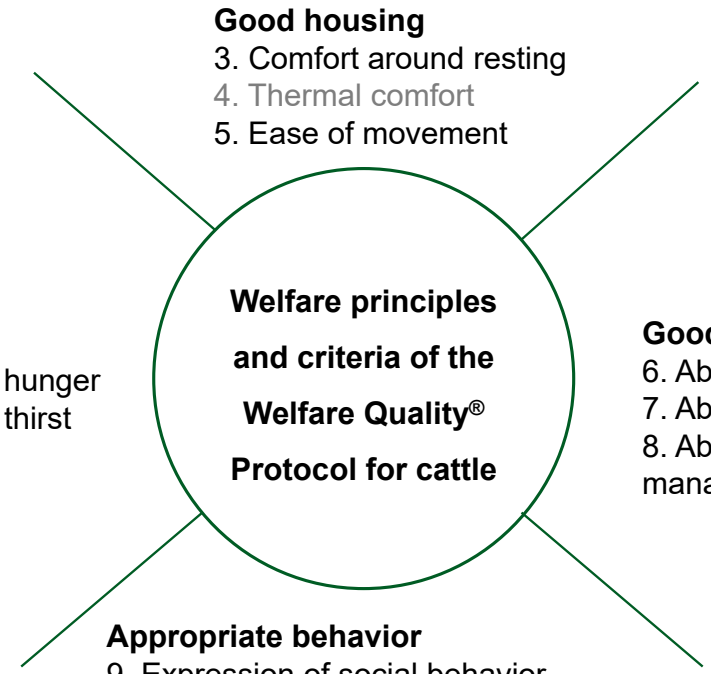
Welfare assessment



Good housing
3. Comfort around resting
4. Thermal comfort
5. Ease of movement

Good feeding
1. Absence of prolonged hunger
2. Absence of prolonged thirst

Good health
6. Absence of injuries
7. Absence of disease
8. Absence of pain induced by management procedures

Appropriate behavior
9. Expression of social behavior
10. Expression of other behavior
11. Good human-animal relationship
12. Positive emotional state

Excellent

Enhanced

Acceptable

Not classified

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Classification system

		0 Points	1 Point	2 Points
	**Milking**	Conventional	Batch	Milking robot
	**Feeding**	Conventional	Feed pusher	Feeding robot
	**Cleaning**	Tractor/manual	-	Scraper/cleaning robot
	**Bedding**	Manual	-	Bedding robot

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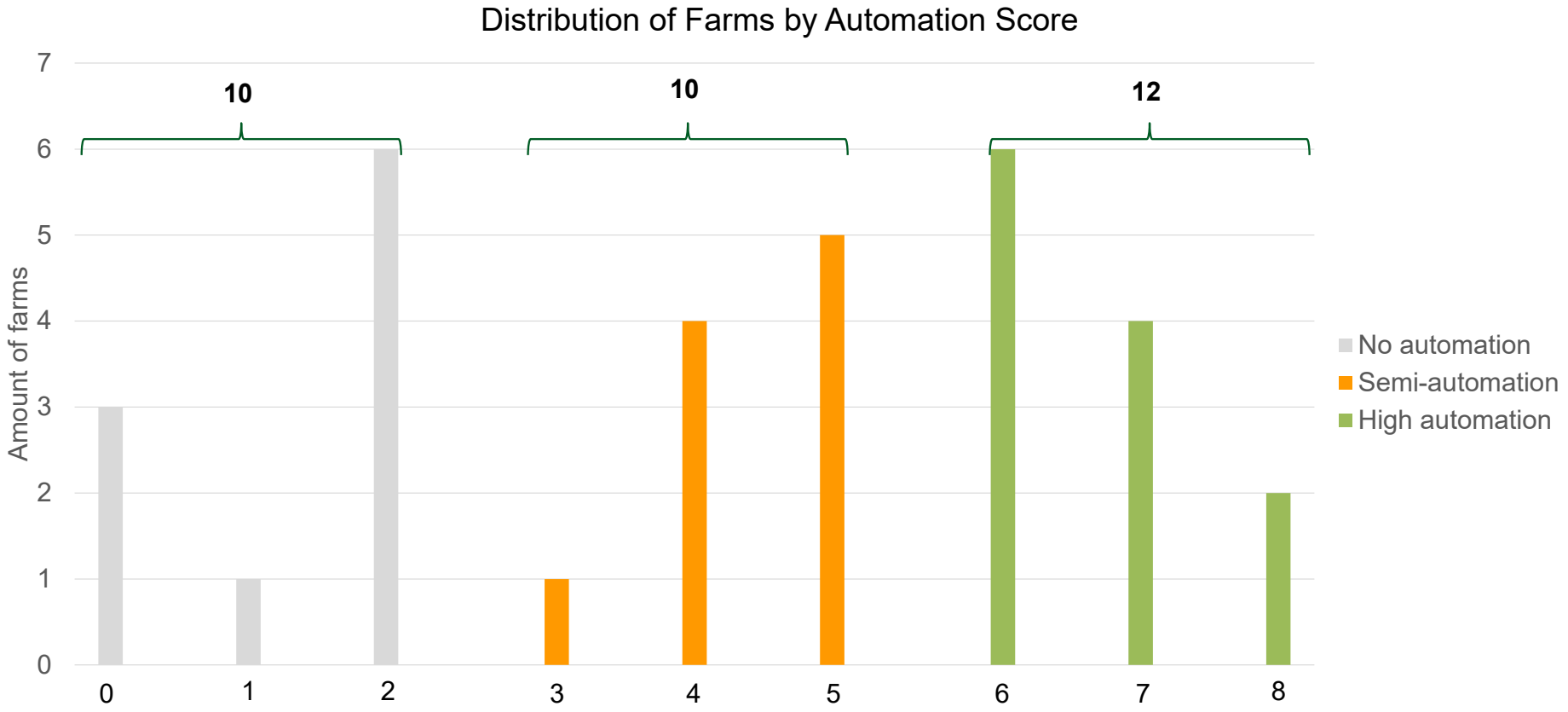
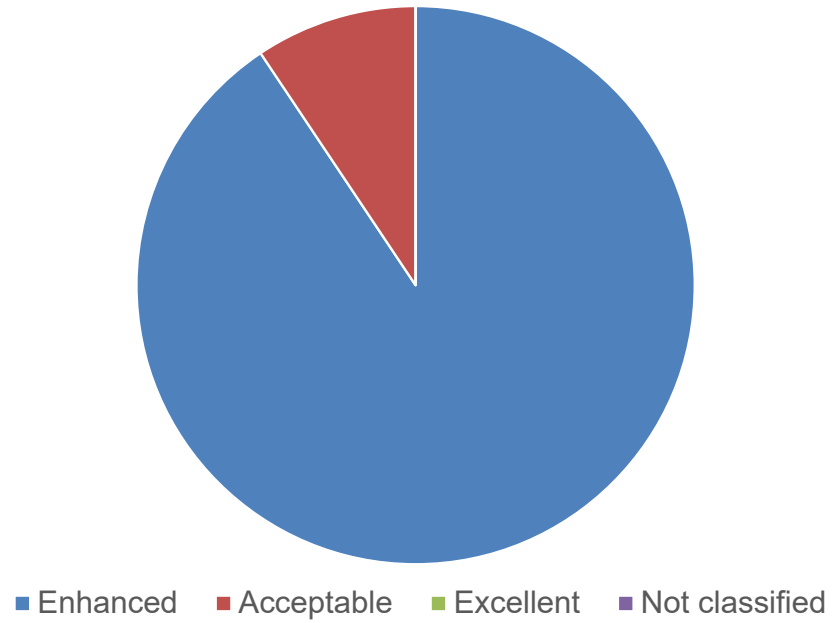
Classification system



Results



- 90.6 % → “enhanced”
- 9.4 % → “acceptable”
- no classification as “excellent” or “not classified”

Most farms achieved an “enhanced” welfare classification

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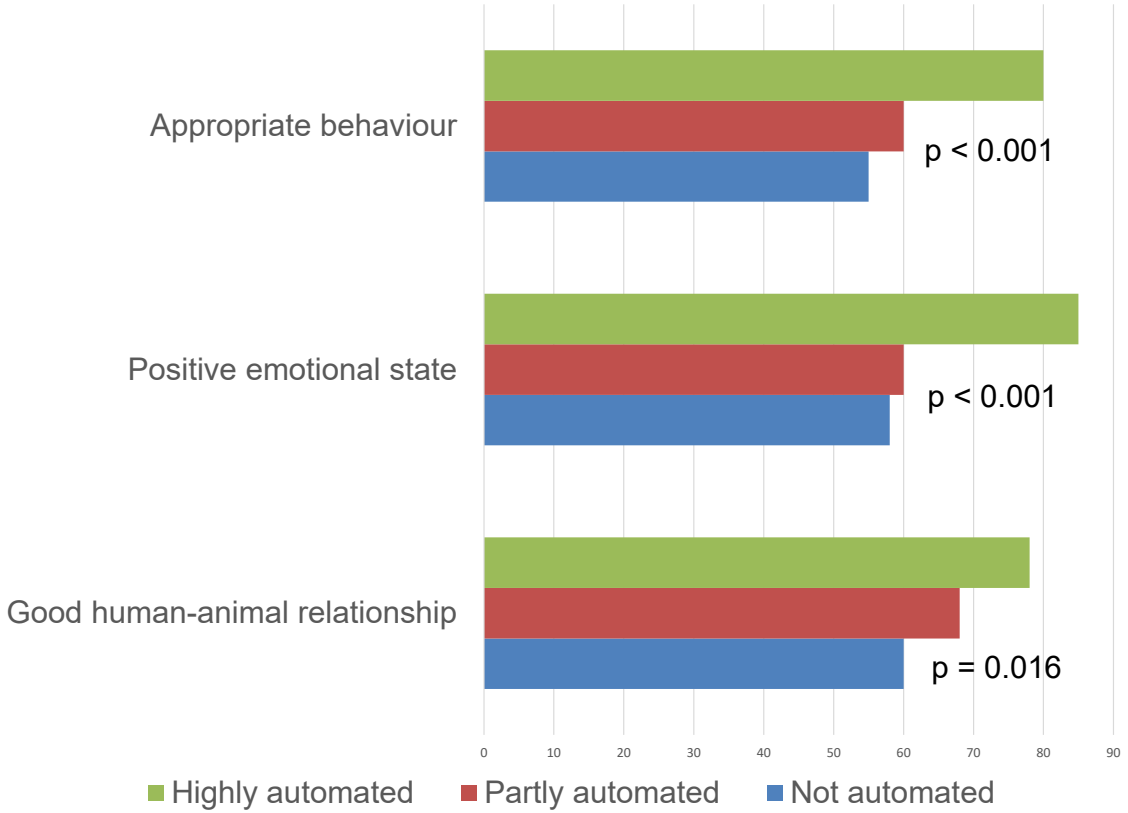
Results



Lower prevalence on highly automated farms:

- severely lame cows ↓ (*p = 0.03*)
- dirty lower legs ↓ (*p = 0.049*)
- avoidance distance >100 cm ↓ (*p = 0.005*)

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Discussion and Conclusion

- Higher automation level was associated with significant better:
  - appropriate behavior
  - human–animal relationship
  - positive emotional state
- Best housing and health outcomes on highly automated farms:
- Possible contributing factors:
  - AMS → more relaxed cows
  - AFS → higher feeding frequencies
  - bedding robot → cleaner and drier cubicles

➡ **Automation can support animal welfare in dairy farming**

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