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Does access to pasture affect welfare in dairy cows?

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Pasturing of dairy cows

PRO

CONTRA

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soft, non-slip underground →
freedom of movement

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How does access to pasture affect welfare in dairy cows?



Animals, Material and Methods

- 61 dairy farms located in north-west Germany
- Average herd size: 129 Holstein-Friesian cows (range: 58 – 527)
- System: Cubicle housing
- Sample size: approx. 40 – 80 animals per farm → ~ 6.300 animals
- 2 farm visits within 12 months
 - Welfare Quality[®] Protocol (WQP)
 - End of pasture season 2014
 - End of winter season 2015

Farms clustered based on access to pasture

Group 1 (n=15)

- > 10 h pasture/ day
- min. 120 days / year

Group 2 (n=15)

- 6-10 h pasture/ day
- min. 120 days / year

Group 3 (n=15)

- 1-6 h pasture/ day
- min. 120 days / year

Group 4 (n=16)

- no access to pasture

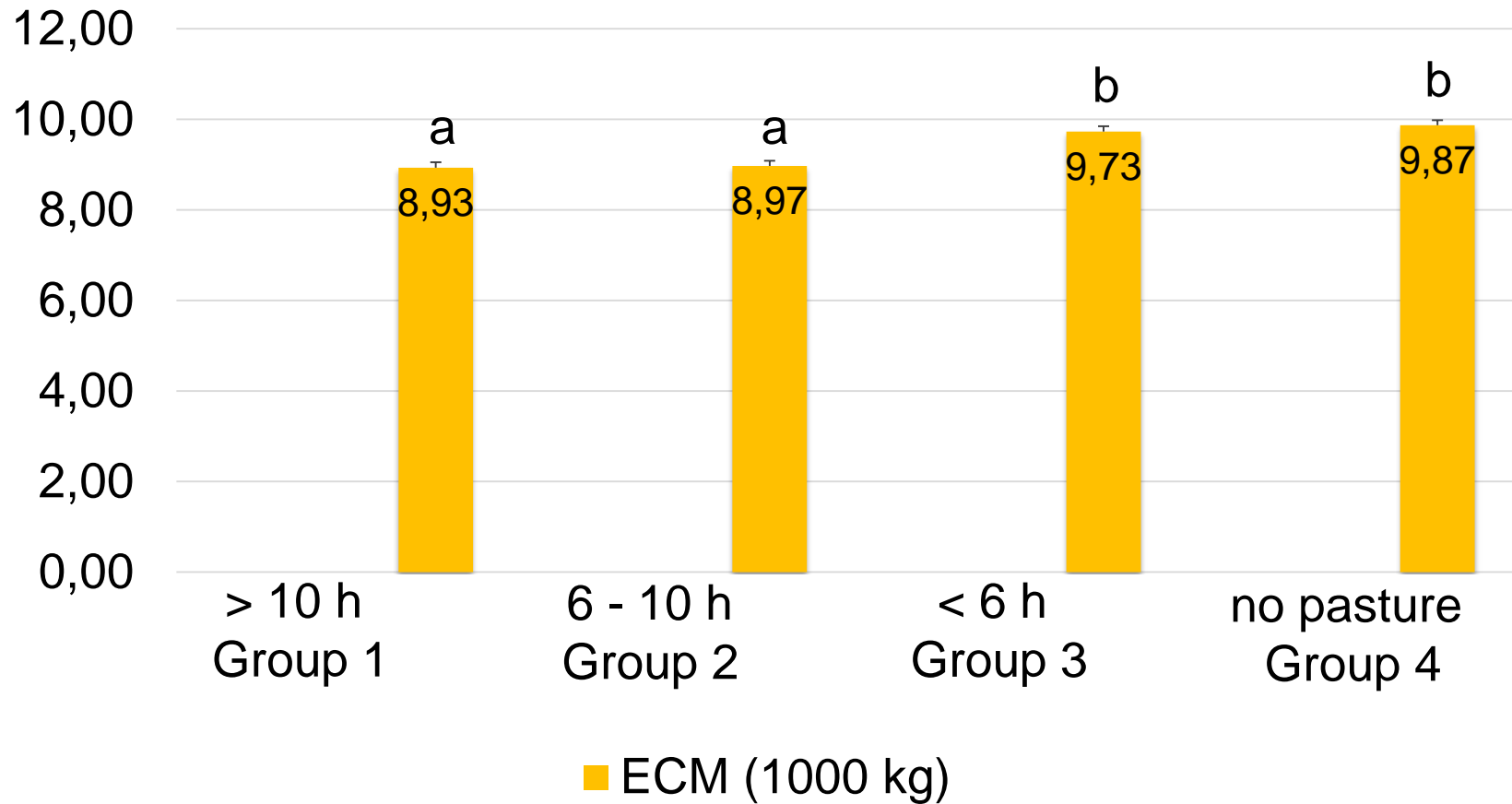
Welfare Quality[®] Protocol

Overall-score	Principles	Criteria	Indicators	Classification
 <p>„excellent“</p> <p>„improved“</p> <p>„acceptable“</p> <p>„unclassified“</p>	Good Feeding	Hunger	BCS	Animal-based
		Thirst	Trough Length, Cleanness	Resource
	Good Husbandry	Resting Comfort	Duration of Lying down, Collisions,...	Animal-based
			Climatic Comfort	-----
		Free Movement	Tethered Housing	Resource
	Good Health	Injuries	Skin lesions, Lameness,...	Animal-based
			Diseases	Discharge, Coughing, Mastitis, Mortality,...
		Pain	Dehorning, Tail docking	Management
	Appropriate Behaviour	Social Behaviour	Head-butts, Displacements	Animal-based
			Natural Behaviour	Access to Pasture
		Human-Animal Interaction	Avoidance Distance	Animal-based
		Emotional State	Behavioural Evaluation	Animal-based

Statistical analysis

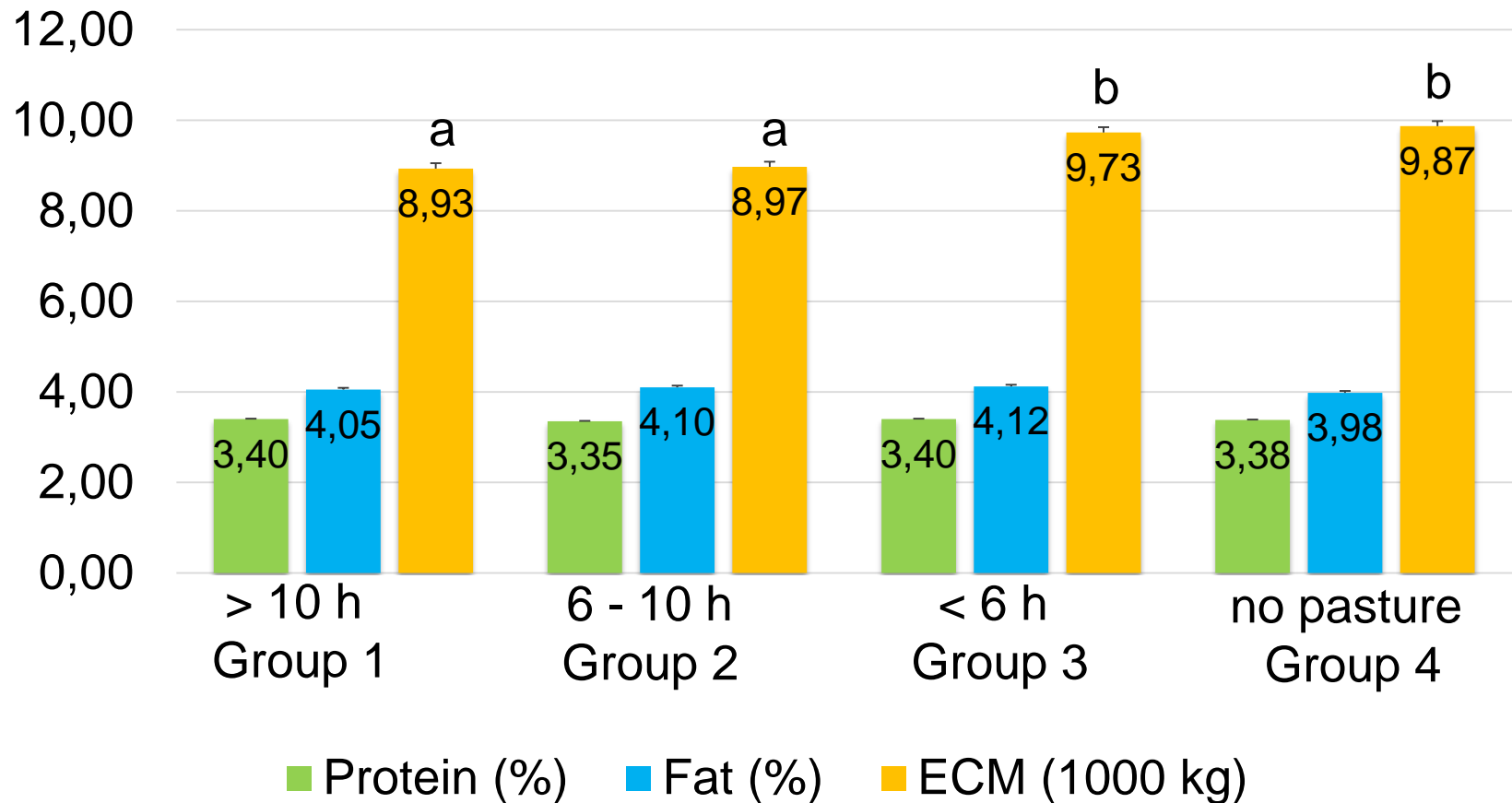
- GLIMMIX procedure for generalized linear mixed models (SAS, version 9.3)
- $Y_{ijk} = \mu + a_i + b_j + c_{ij} + d_k + \epsilon_{ijk}$
 - Y_{ijk} = principles/ criteria/ indicators
 - μ = overall mean
 - a_i = fixed effect of group_i (G1, G2, G3, G4)
 - b_j = fixed effect of farm visit_j (1, 2)
 - c_{ij} = interaction between group_i and farm visit_j
 - d_k = random effect of the farm_k
 - ϵ_{ijk} = residual error

ECM, Protein and Fat yields (2012 - 2015)



a, b $P < 0.1$

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Results:

Assessment of farms by WQP – overall score

Pasture Group	Farm Visit	excellent	improved	acceptable	un-classified
Group 1 >10 h	Summer	0			0
	Winter	0			0
Group 2 6 – 10 h	Summer	0			0
	Winter	0			0
Group 3 < 6 h	Summer	0			0
	Winter	0			0
Group 4 0 h	Summer	0			0
	Winter	0			0



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Group 4 0 h	Summer	0			0
	Winter	0			0



Results:

Assessment of farms by WQP – overall score

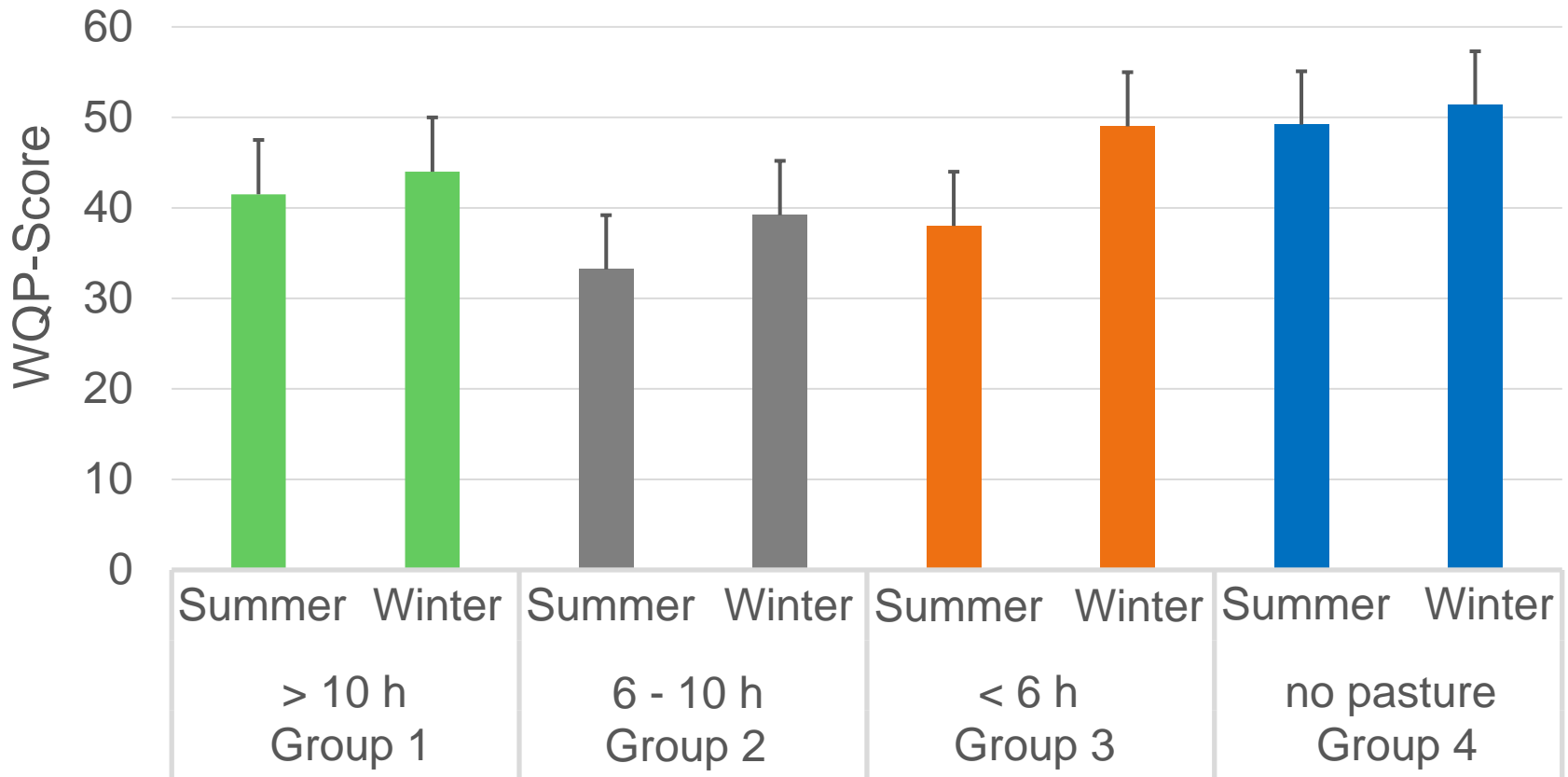
Pasture Group	Farm Visit	excellent	improved 	acceptable 	un-classified
Group 1 >10 h	Summer	0	10	5	0
	Winter	0			0
Group 2 6 – 10 h	Summer	0	5	10	0
	Winter	0			0
Group 3 < 6 h	Summer	0	6	9	0
	Winter	0			0
Group 4 0 h	Summer	0	4	12	0
	Winter	0			0

Results:

Assessment of farms by WQP – overall score

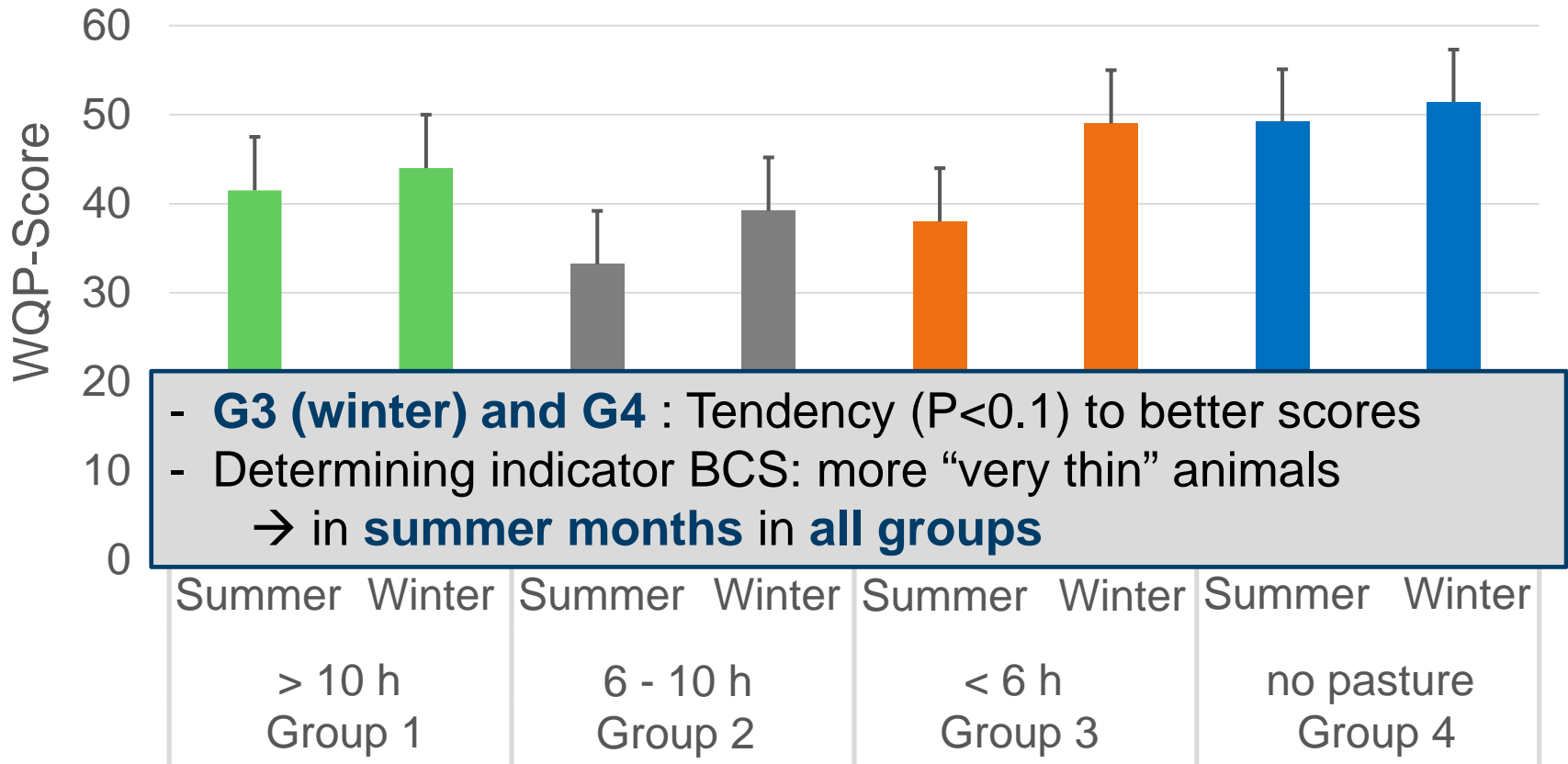
Pasture Group	Farm Visit	excellent	improved 	acceptable 	un-classified
Group 1 >10 h	Summer	0	10	5	0
	Winter	0	3	12	0
Group 2 6 – 10 h	Summer	0	5	10	0
	Winter	0	8	7	0
Group 3 < 6 h	Summer	0	6	9	0
	Winter	0	9	6	0
Group 4 0 h	Summer	0	4	12	0
	Winter	0	8	8	0

Results of the principle GOOD FEEDING



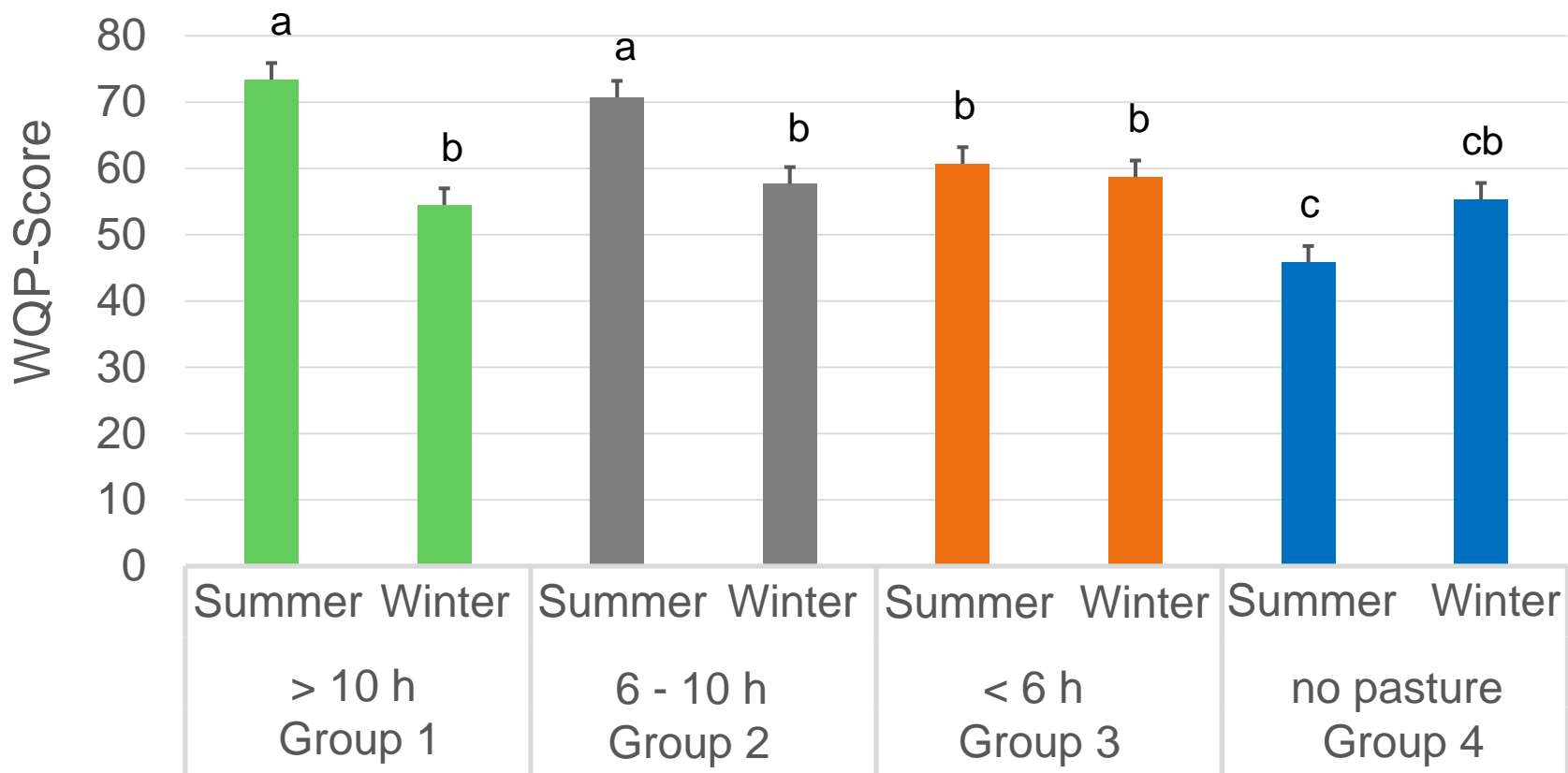
$P > 0.05$ No significant differences

Results of the principle GOOD FEEDING



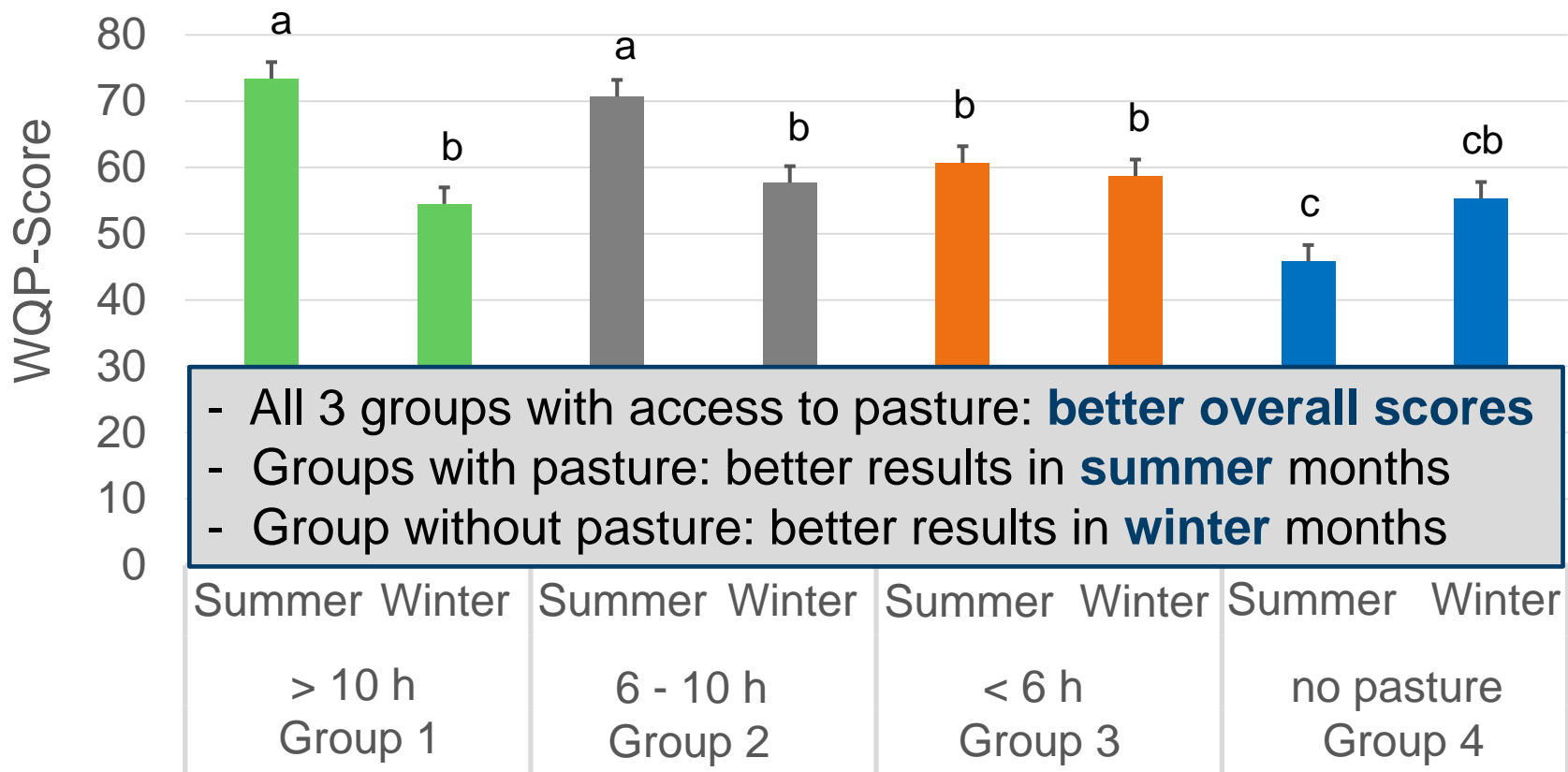
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Results of the principle GOOD HUSBANDRY



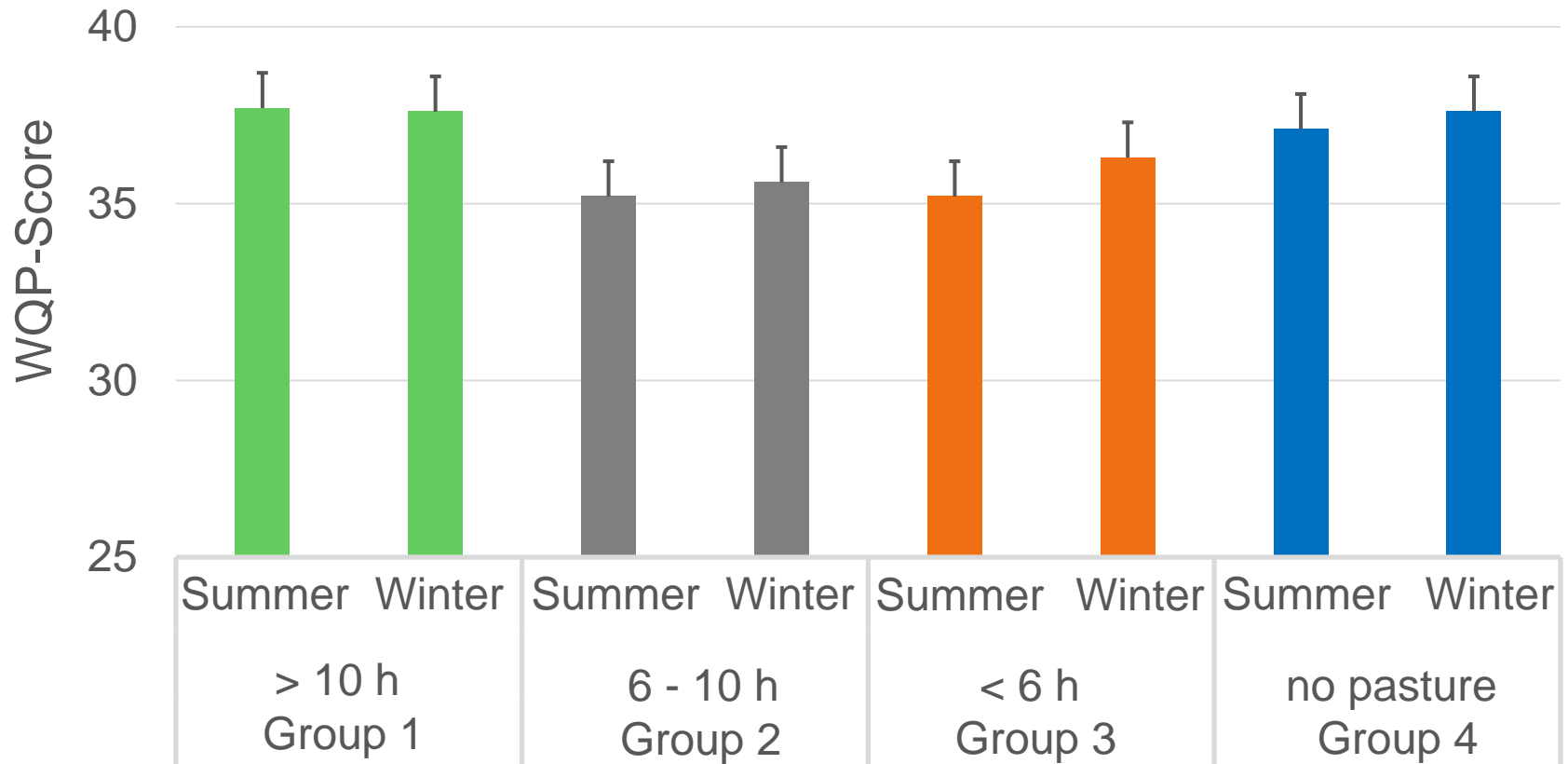
a, b, c $P < 0.05$

Results of the principle GOOD HUSBANDRY



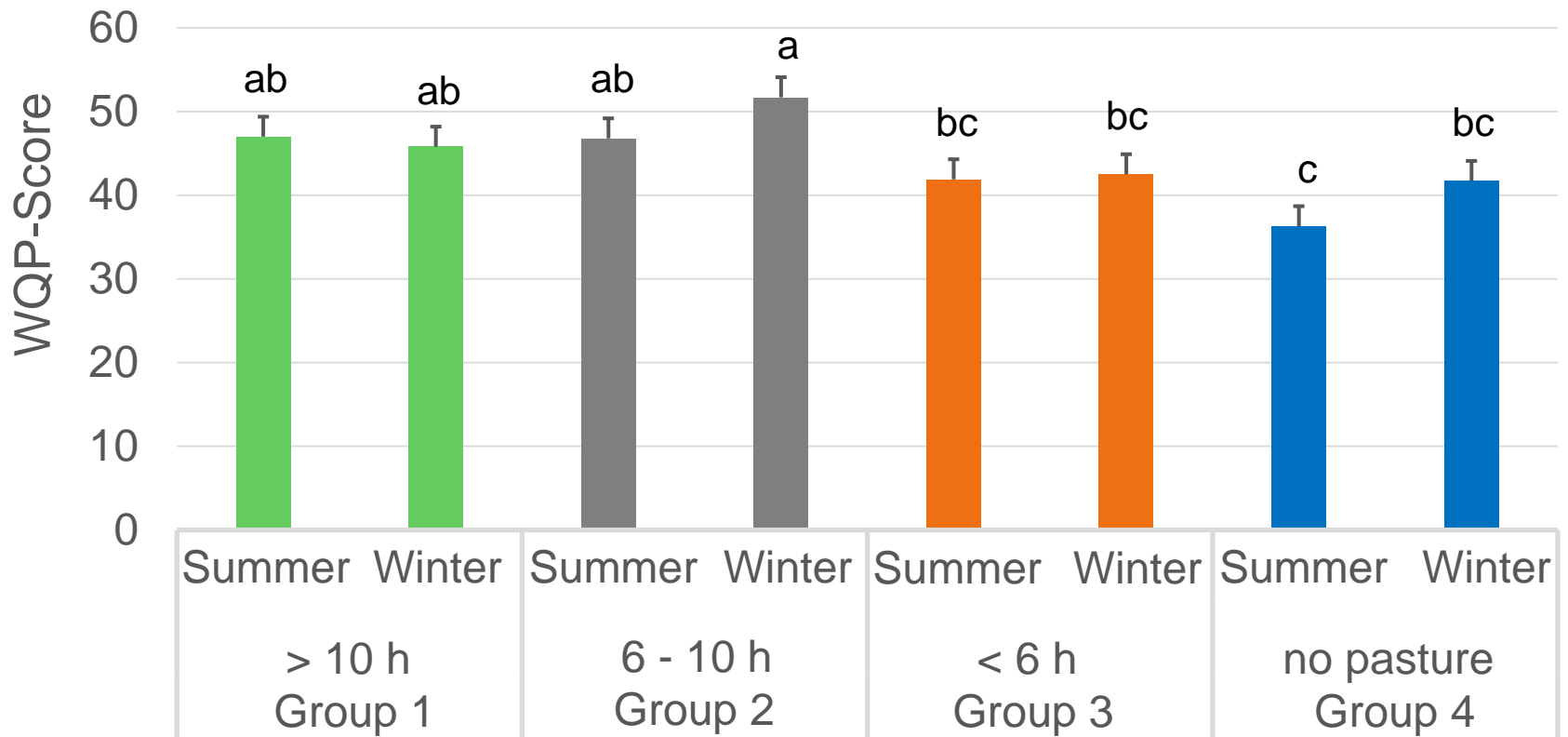
a, b, c P < 0.05

Results of the principle APPROPRIATE BEHAVIOUR



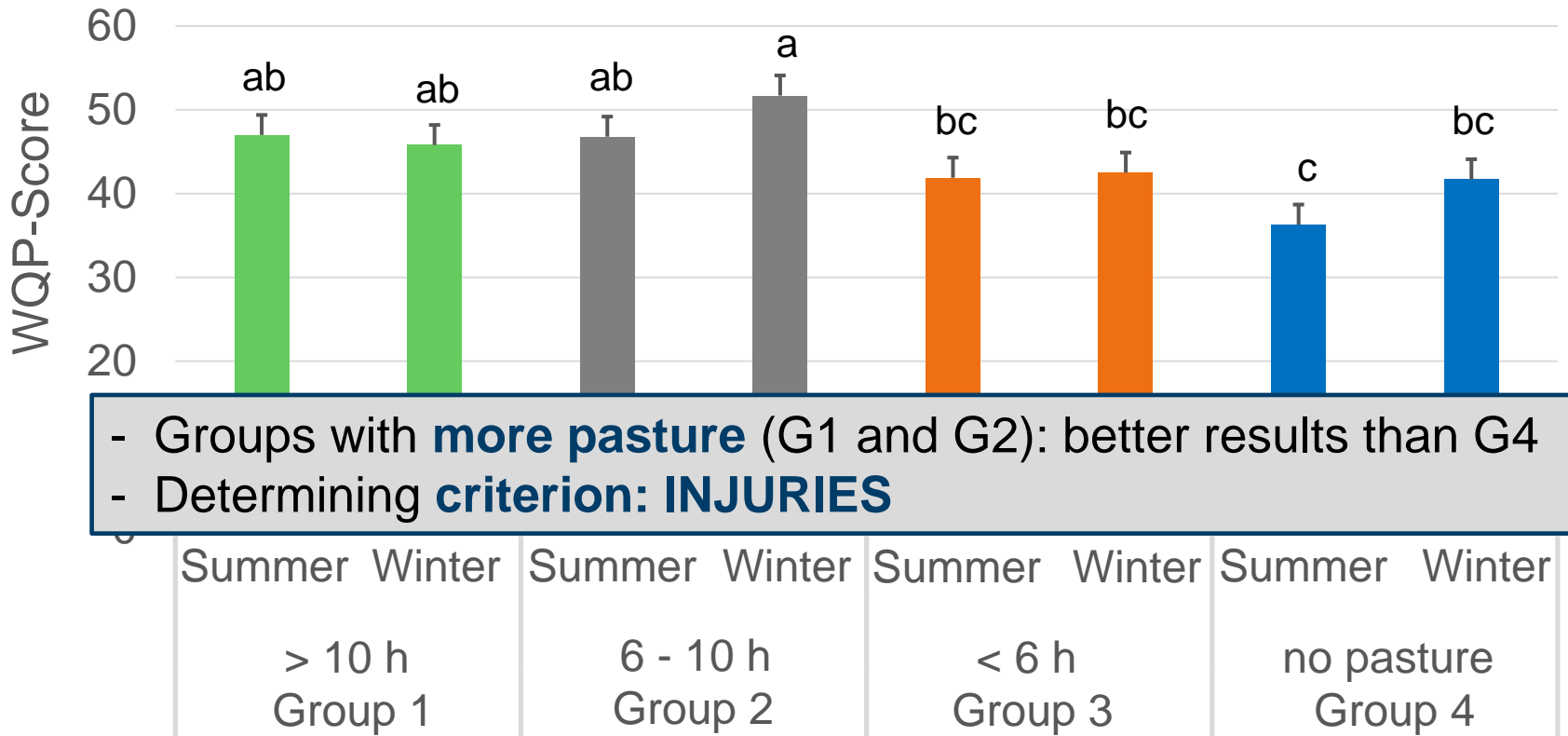
$P > 0.05$ No significant differences

Results of the principle GOOD HEALTH



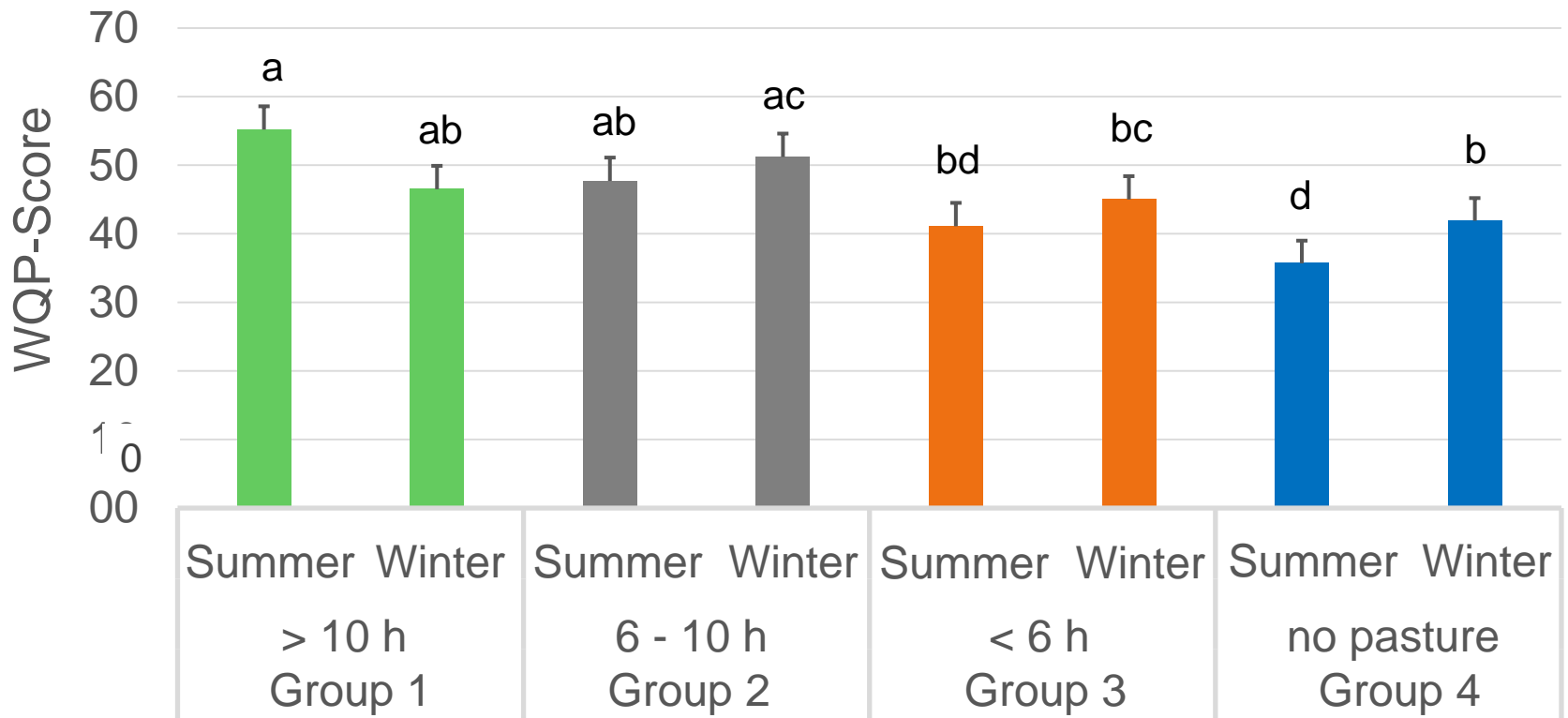
a, b, c $P < 0.05$

Results of the principle GOOD HEALTH



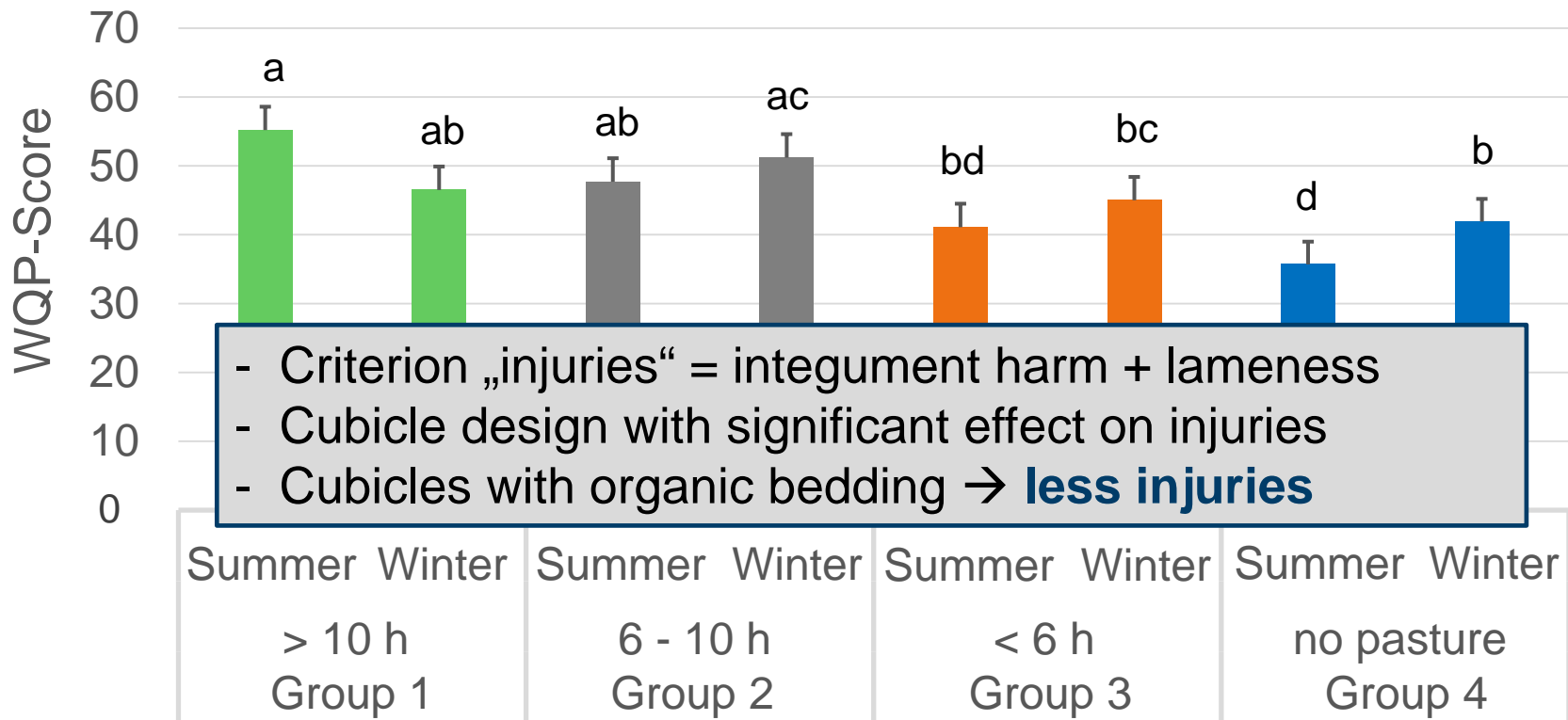
a, b, c $P < 0.05$

Results of the criterion INJURIES



a, b, c, d $P < 0.05$

Results of the criterion INJURIES



a, b, c, d $P < 0.05$

Conclusions

- **Principle „good husbandry“** (duration of lying down, collisions, animals lying on slatted floor, cleanliness):
groups with access to pasture had higher scores than farms without pasture access
- **Principle „good health“** (skin lesions, lameness, diseases):
groups with at least 6 h/day on pasture had higher scores than groups with less than 6 h/day or no time on pasture
- During summer months farms with access to pasture showed **better overall scores** than farms without access to pasture
→ no difference at the end of the winter period



Acknowledgment

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für Wissenschaft und Kultur

