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Animal Welfare Status in Dairy Cattle Farms of the Parmigiano Reggiano Consortium

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INTRODUCTION

THE CONCEPT OF ANIMAL WELFARE

- Animal Welfare (AW) definition? WOAH defined Animal Welfare as the way in which an animal is able to adapt to the environment in which it lives.
- There is a general view that intensive livestock farming has negative consequences both on animal health, welfare and food safety.
- Consumers' point of view? ~17% of the Italian population is willing to pay 10% extra cost to buy products coming from sustainable animals' livestock.

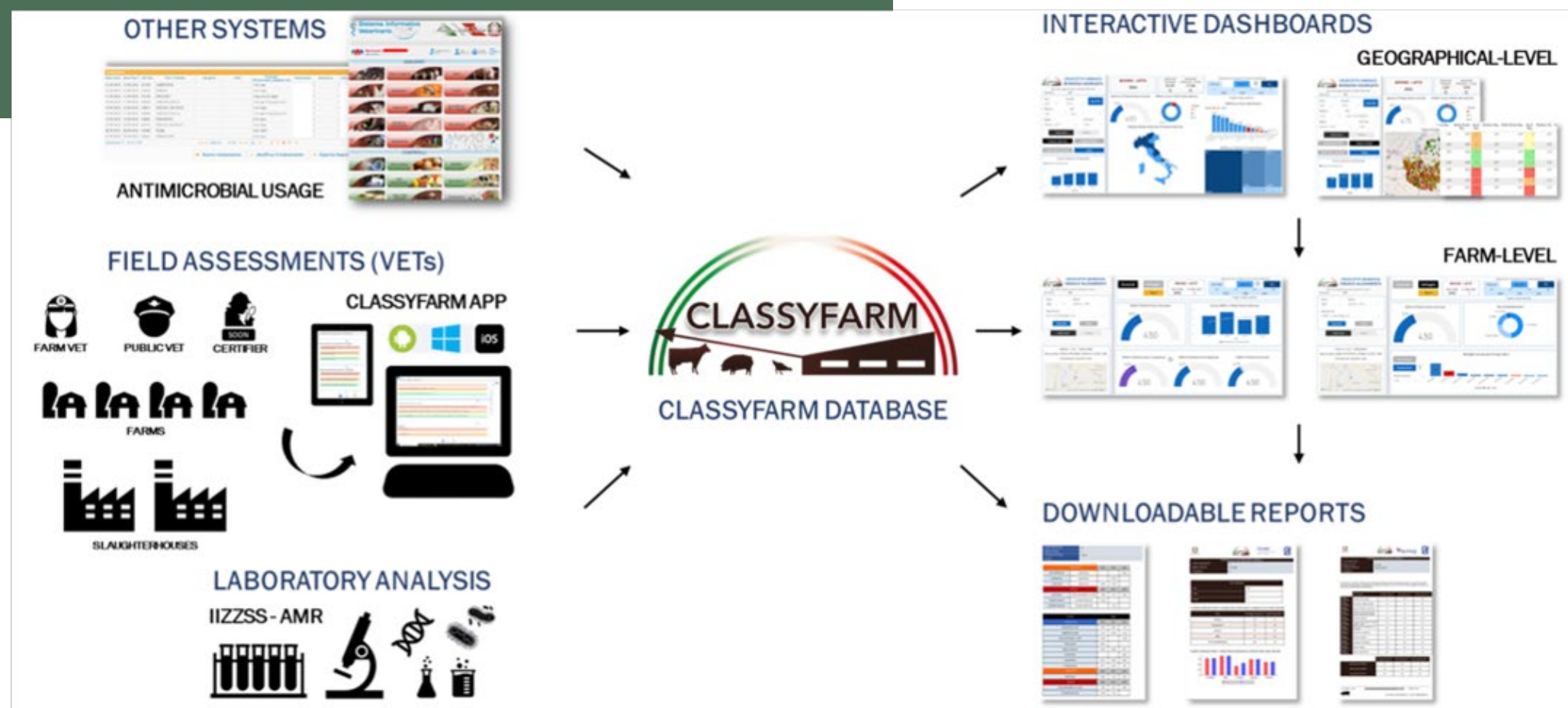




INTRODUCTION

ANIMAL WELFARE INDICATORS AND THE CLASSYFARM SYSTEM

- From 2004, the Italian Ministry of Health, together with the Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna (IZSLER) and the Centro di Referenza Nazionale per il Benessere Animale (CReNBA), activated the ClassyFarm System.





AIM OF THE PROJECT

The objective of this project was to evaluate the welfare status of dairy cattle herds involved in the Parmigiano Reggiano cheese production using data from the ClassyFarm system. More precisely to:

- Compare the Animal Welfare status between free and tie stall housing systems;
- Estimate the relationship of the welfare scores recorded by the ClassyFarm platform and identify the most important welfare parameters recorded on farm for the AW assessment of farms.



MATERIALS AND METHODS

- Data collected in 2022.
- Principal component analysis (factoextra; Kassambara and Mundt, 2020).
- Best subset selection (performance; Lüdtke et al., 2021).



Tie stalls	Free housing system
329 observations and 115 variables	649 observations and 121 variables
99 questions: • Biosecurity area: 15 questions; • Area A: 25 questions; • Area B: 30 questions; • Area C: 20 questions; • Area High risks and alarm system: 9 questions.	105 questions: • Biosecurity area: 15 questions; • Area A: 30 questions; • Area B: 32 questions; • Area C: 19 questions; • Area High risks and alarm system: 9 questions.



MATERIAL AND METHODS

THE CLASSYFARM SYSTEM



- The method at the basis of this system analyzes **two groups of data**: the ones **linked to the risks that originate from environmental conditions**, and the **direct AW indicators**.

**Area A -
Business and
personnel
management**

**Area B -
Structures
and
equipments**

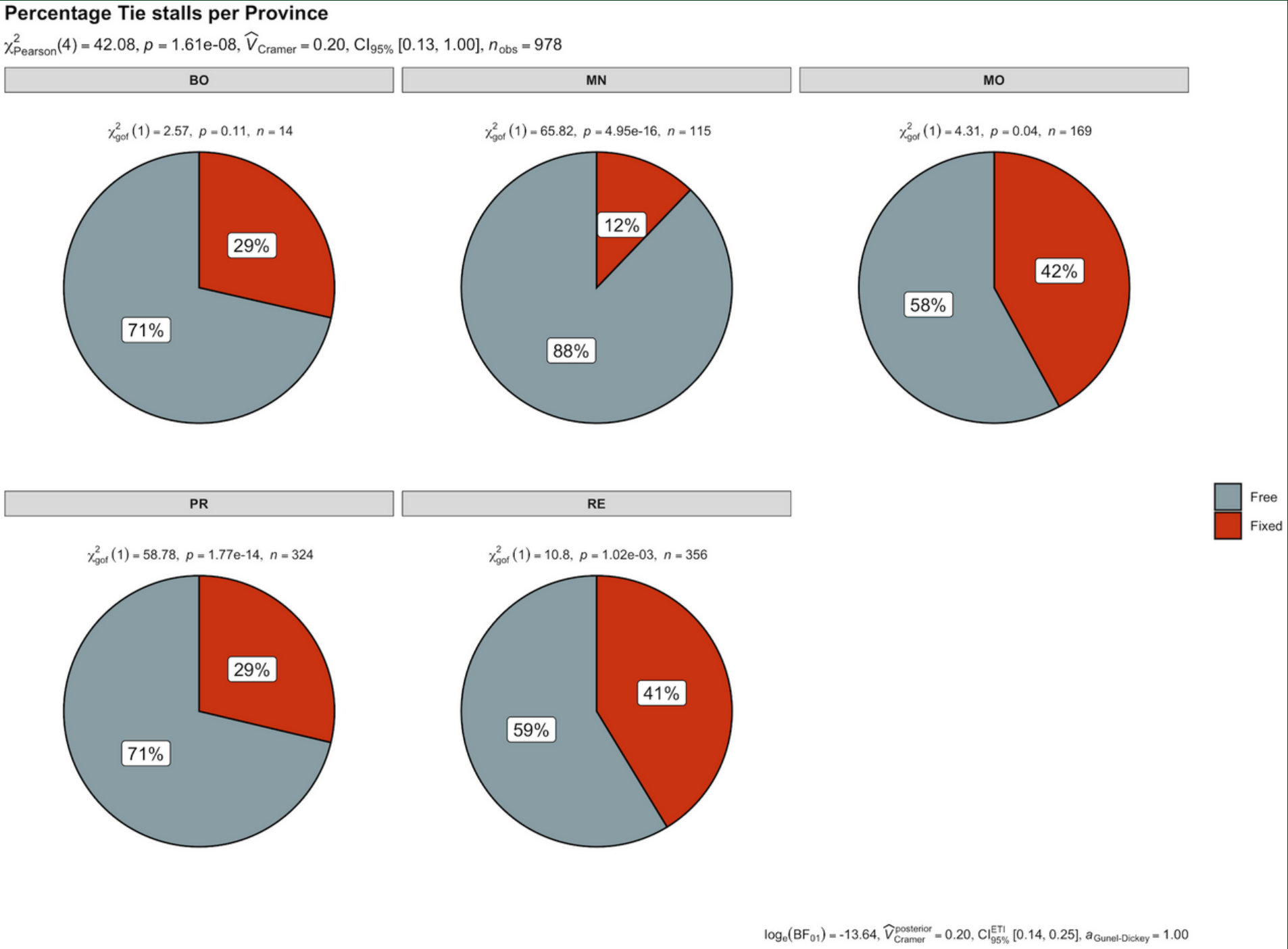
**Area high
risks and
alarm system**

**Area C -
Animal Based
Measures
(ABMs)**

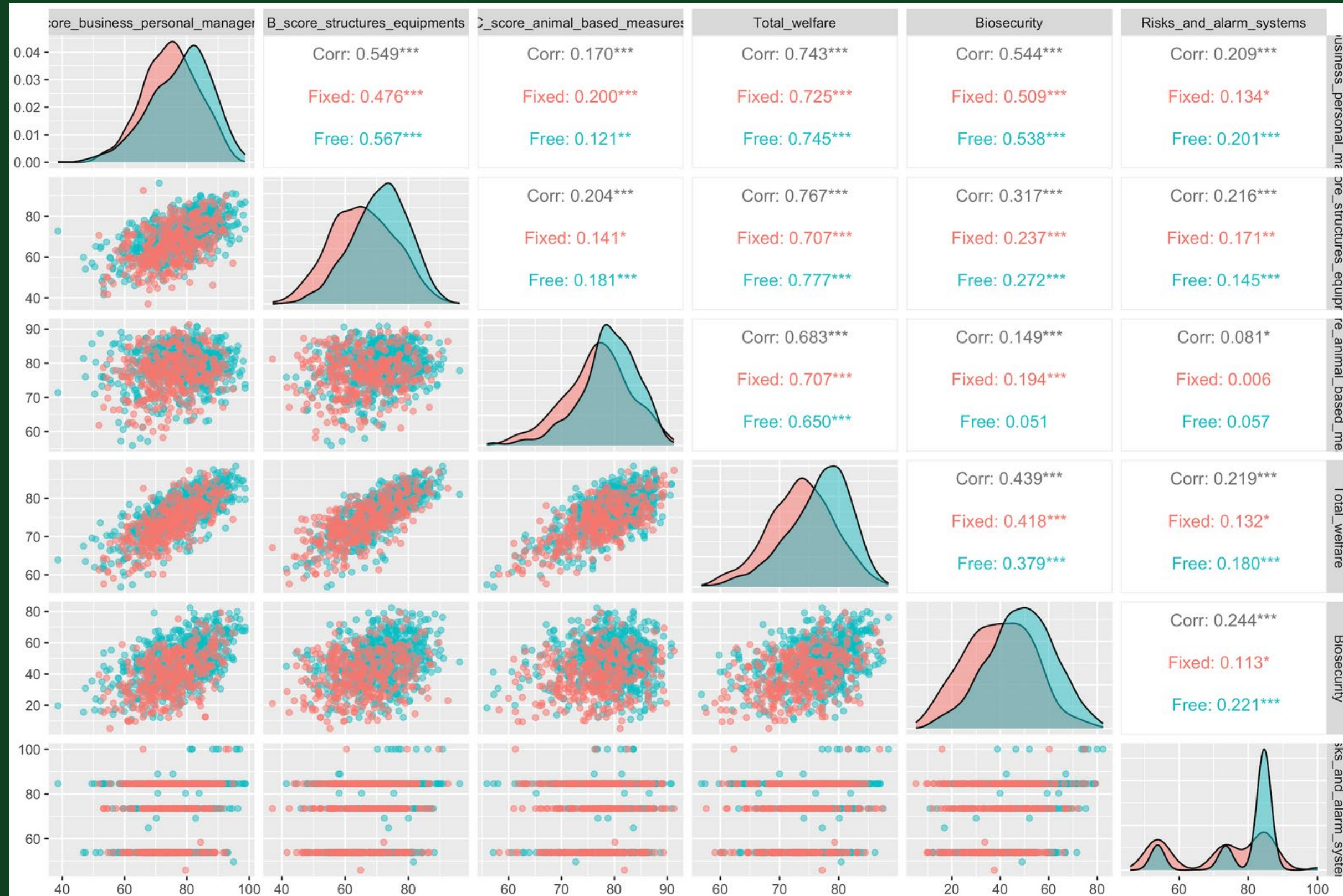
**Biosecurity
Area**

Every area has multiple choice questions and, when making the evaluation, all the animal categories present in the farm will be taken into consideration.

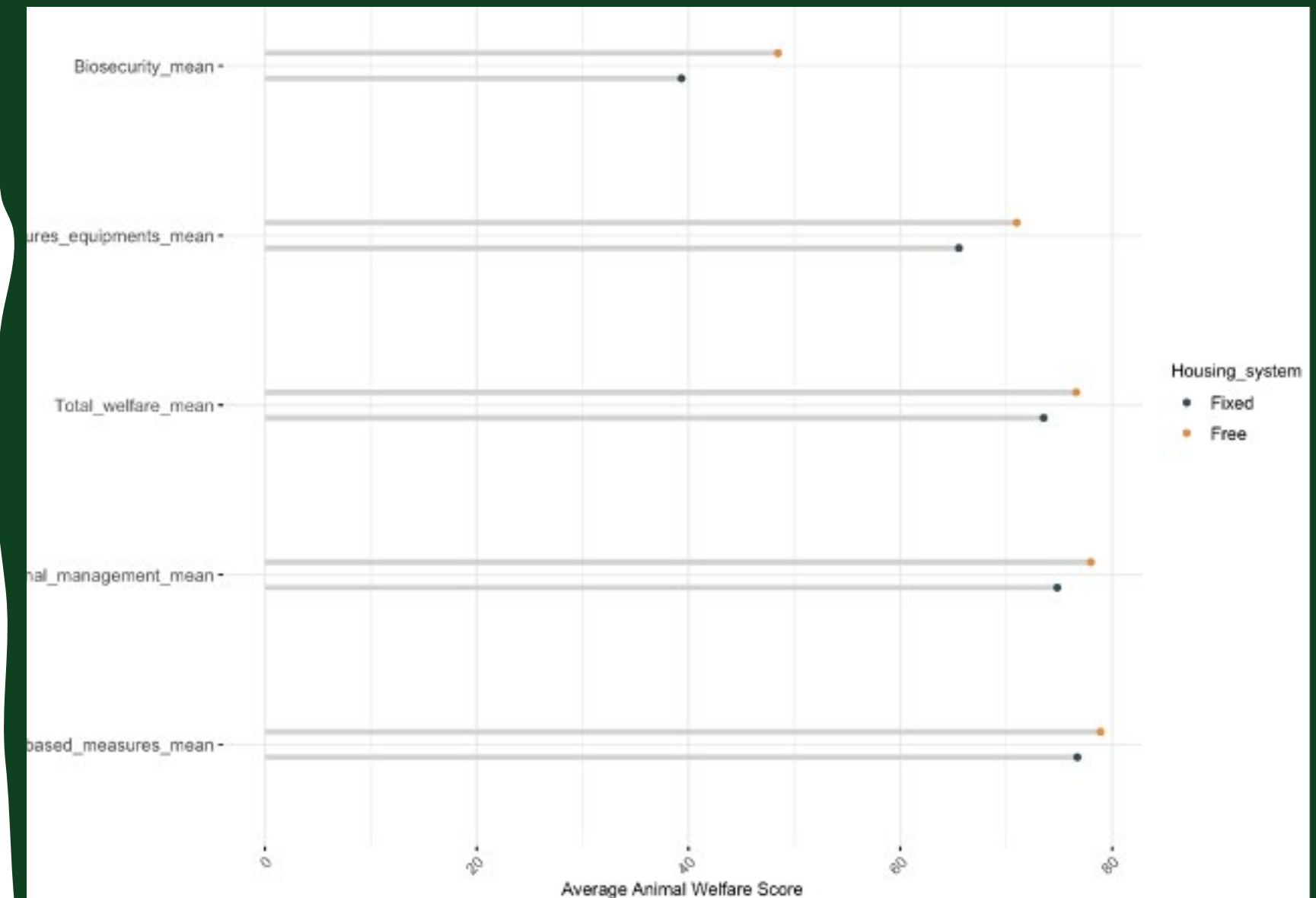
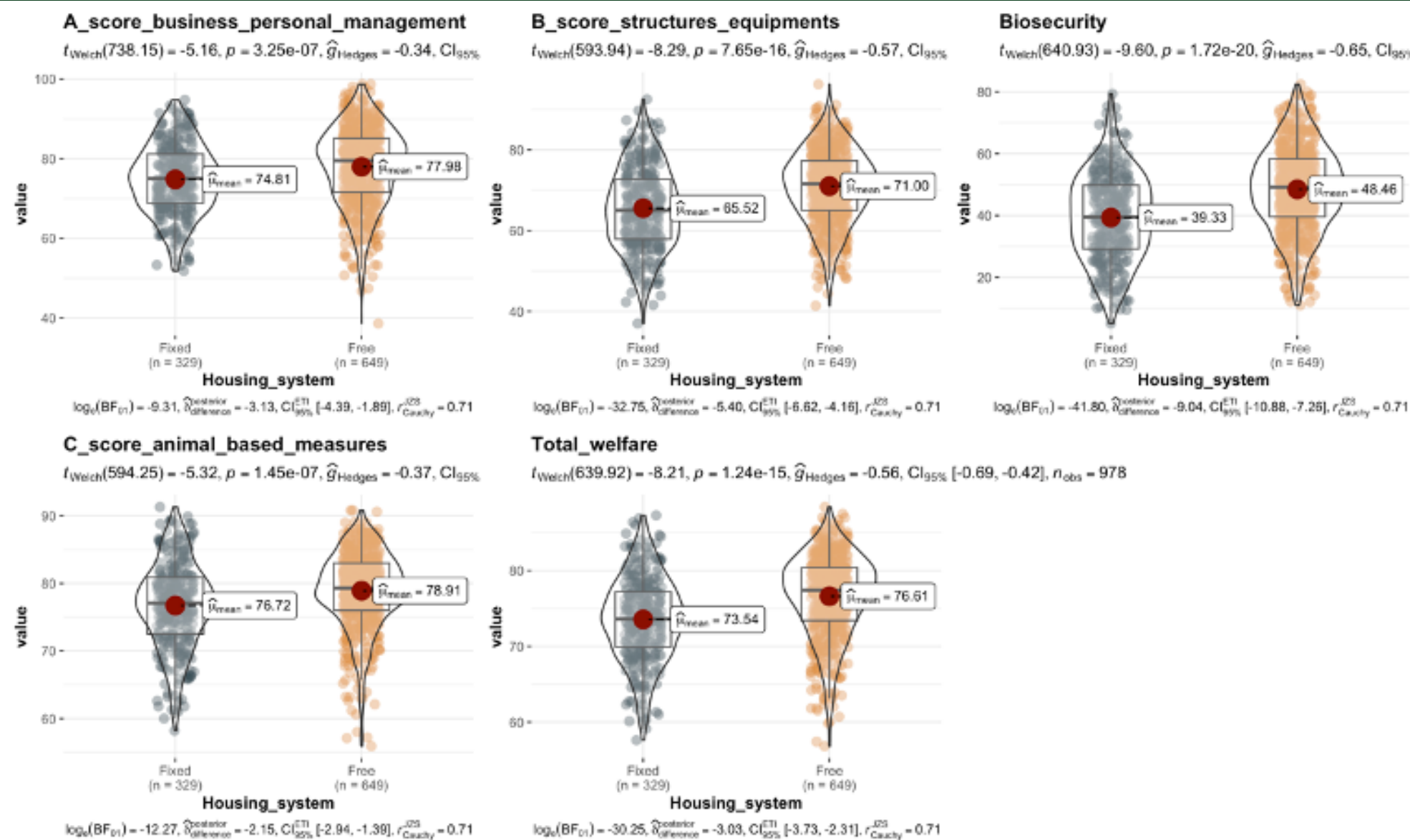
RESULTS



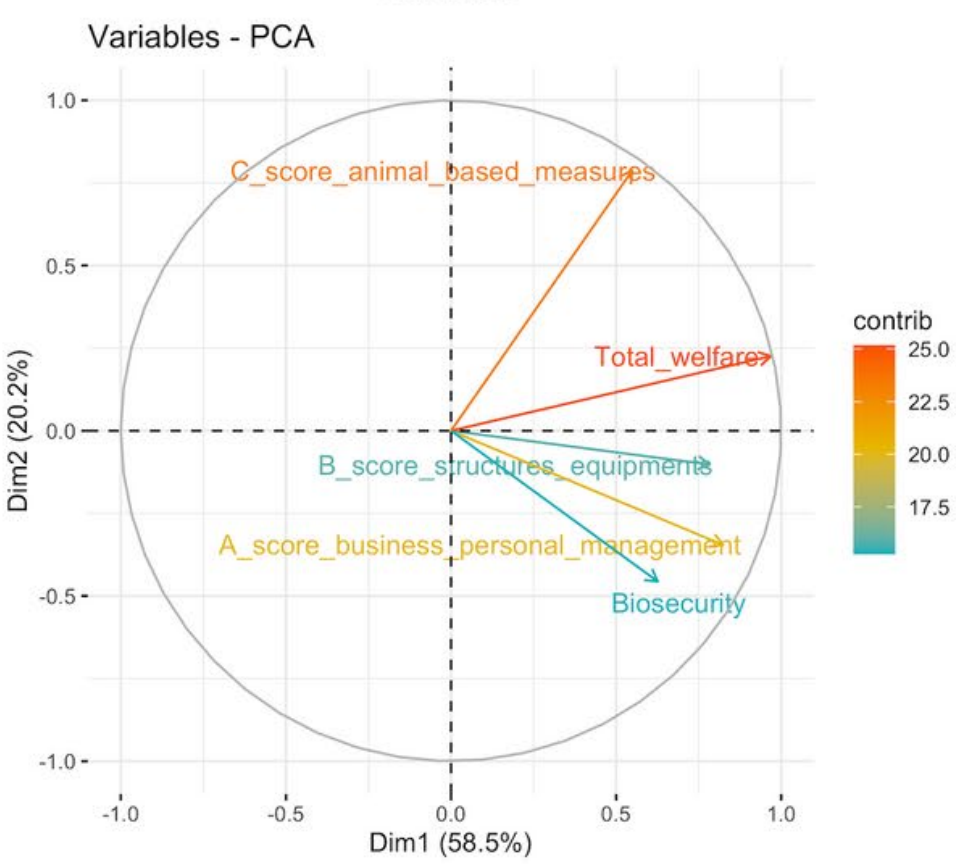
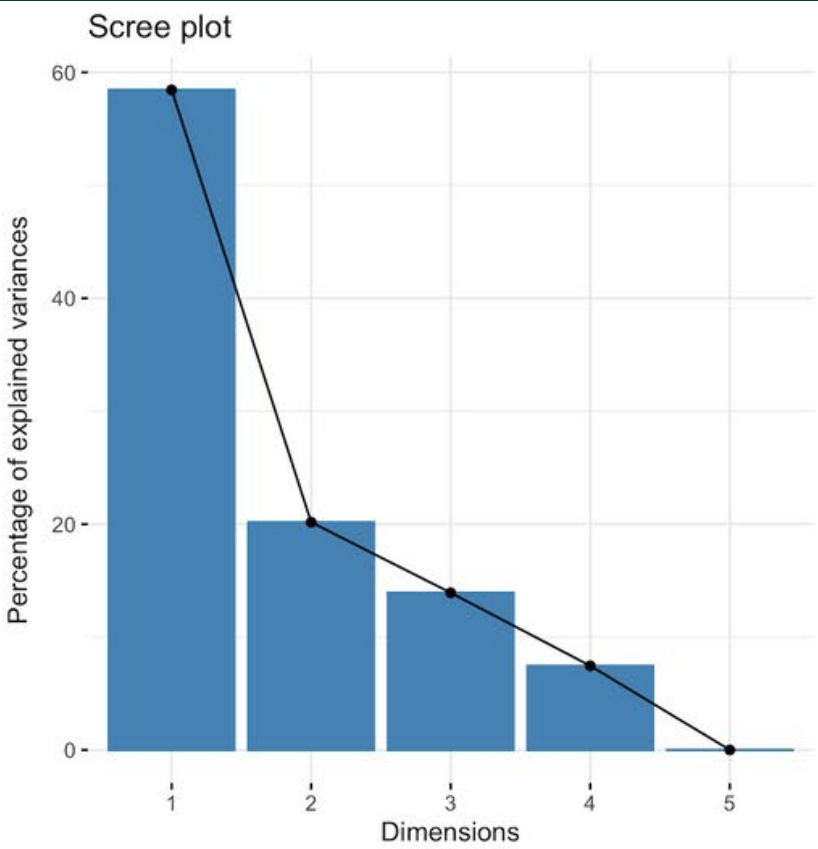
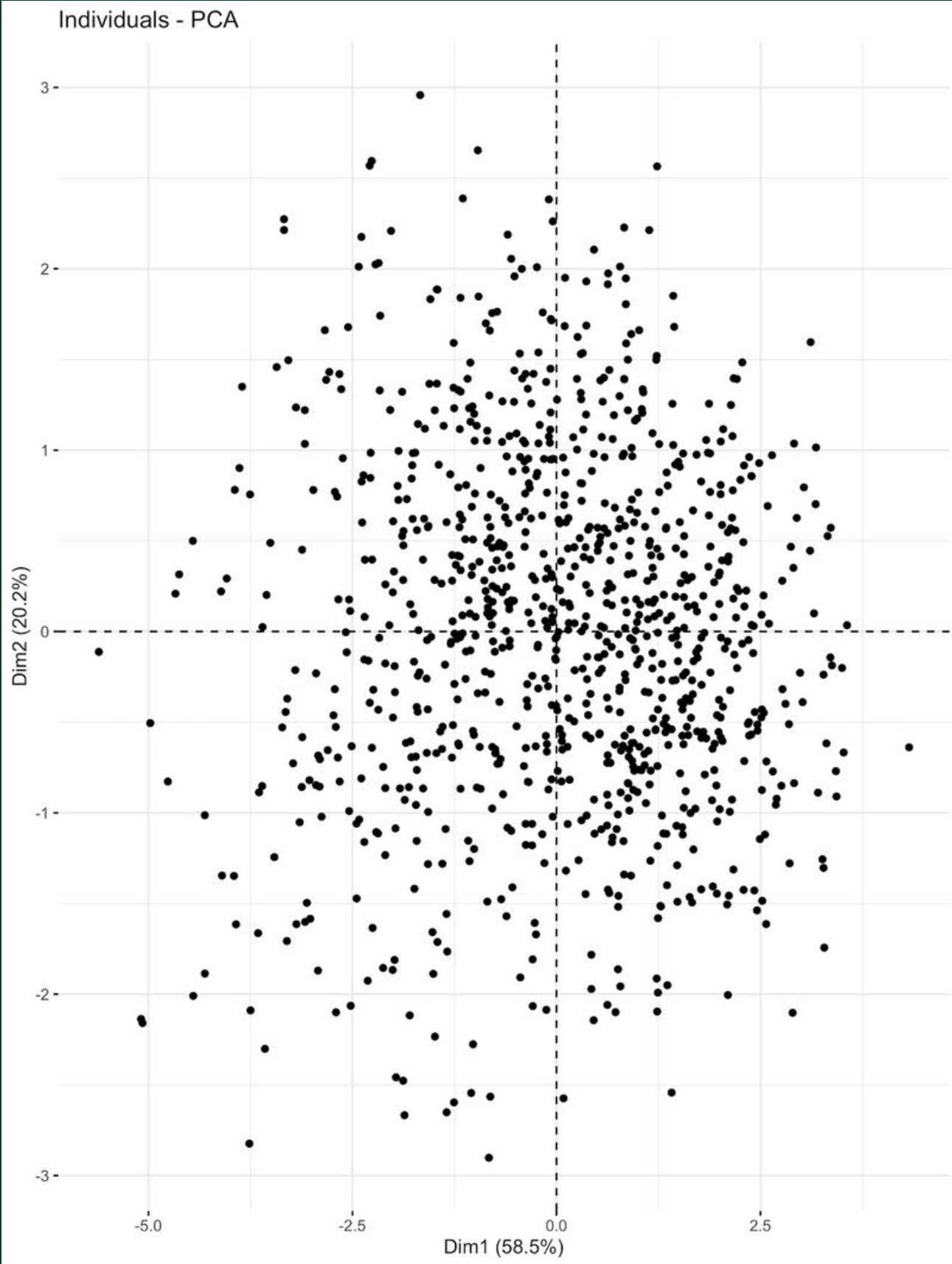
RESULTS - CORRELATIONS OF AW INDICATORS



RESULTS - FREE VS TIE STALL

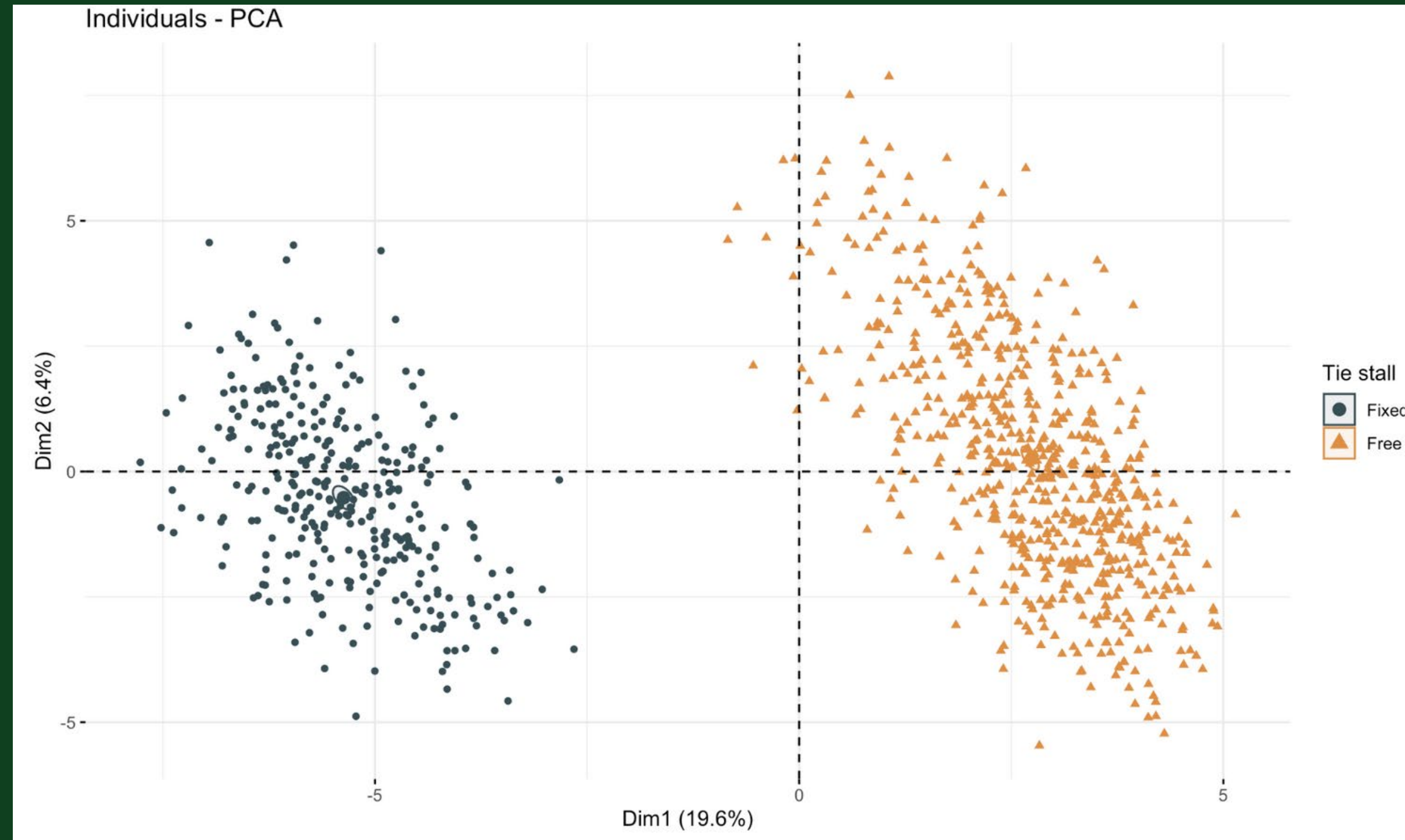


RESULTS - PCA OF 5 AW INDICATORS



Free and Tie stalls housing systems together.

RESULTS - PCA OF THE 99 ITEMS OF THE CLASSYFARM platform



Free and Tie stalls
housing systems
together.

RESULTS - VARIABLES AND BEST MODEL SELECTION AREAS A, B, C, Biosecurity and Total Welfare

		R2		RMSE	
		Full Model° (~20-30 questions)	Reduced model (10 questions)	Full Model° (~20-30 questions)	Reduced model (10 questions)
Free housing system	Area A	0,998	0,924	0,492	4,996
	Area B	0,989	0,861	0,940	3,342
	Area C	0,995	0,959	0,398	1,129
	Area Biosecurity	0,990	0,971	1,477	2,480
	Area Total Welfare	0,996	0,209	0,321	4,797
Tie stall housing system	Area A	0,999	0,976	0,323	1,331
	Area B	0,993	0,987	0,830	1,171
	Area C	0,992	0,904	0,573	1,947
	Area Biosecurity	0,990	0,971	1,477	2,480
	Area Total Welfare	0,997	0,282	0,313	4,723

* In the Biosecurity Area, the analysis was conducted merging the datasets of both the free and tie stall housing systems.

° The full model refers to a set of almost 20-30 questions related to different aspects of dairy cattle welfare in the farms.



CONCLUSIONS

- The task of Parmigiano Reggiano Consortium is the improvement of AW to produce milk and cheeses of high quality → welfare announcements, with the aim to diminish the tie stalls in favor of the free farms.
- Better welfare status of free housing systems compared to tie stalls.
- The analysis indicated that might be feasible to reduce the number of scoring items to a smaller set of carefully chosen scoring items → reduce time/ visit

THANK YOU FOR YOUR ATTENTION

Marica Odini

