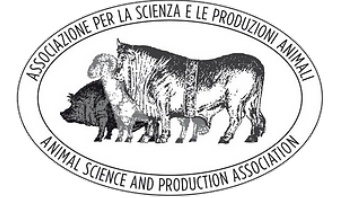




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Relationships between on-farm animal welfare assessment and milk yield in dairy sheep farms

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PLAS TEAM

Pisa Livestock farming, Animal food quality, and Sustainability



Introduction

Close relationship between animal welfare, health and product quality (Munoz et al., 2019; EFSA, 2023).

Several methodologies regarding on-farm animal welfare assessment are now available for dairy farmers (Bertocchi et al., 2018; van Eerdenburg et al., 2021; Zufferey et al., 2021).

Increased demand from consumers regarding welfare standards within livestock farming systems (Tamioso et al., 2018; Zuliani et al., 2018; Alonso et al., 2020).



Introduction

Checklist Classyfarm – created by the **Italian National Animal Welfare Reference Center (CReNBA)** and by the **Istituto Zooprofilattico Sperimentale (IZS)**.

National law 146/2001 (EU directive 98/58/CE)

National law 126/2011 (EU directive 2008/119/CE)

AWIN, Welfare Quality

European Food and Safety Authority (EFSA) recommendations.

Area A
Farm
management

Area B
Farm
structures

Area C
Animal-
based
measures
(ABM)

Area D
Hazard and
alarm
systems

Area E
Biosecurity

Aim of the study

To evaluate if animal welfare score obtained using the Classyfarm checklist, was associated with differences in milk yield and quality in a cohort of dairy sheep farms (DSFs).



Materials and Methods

Experimental design

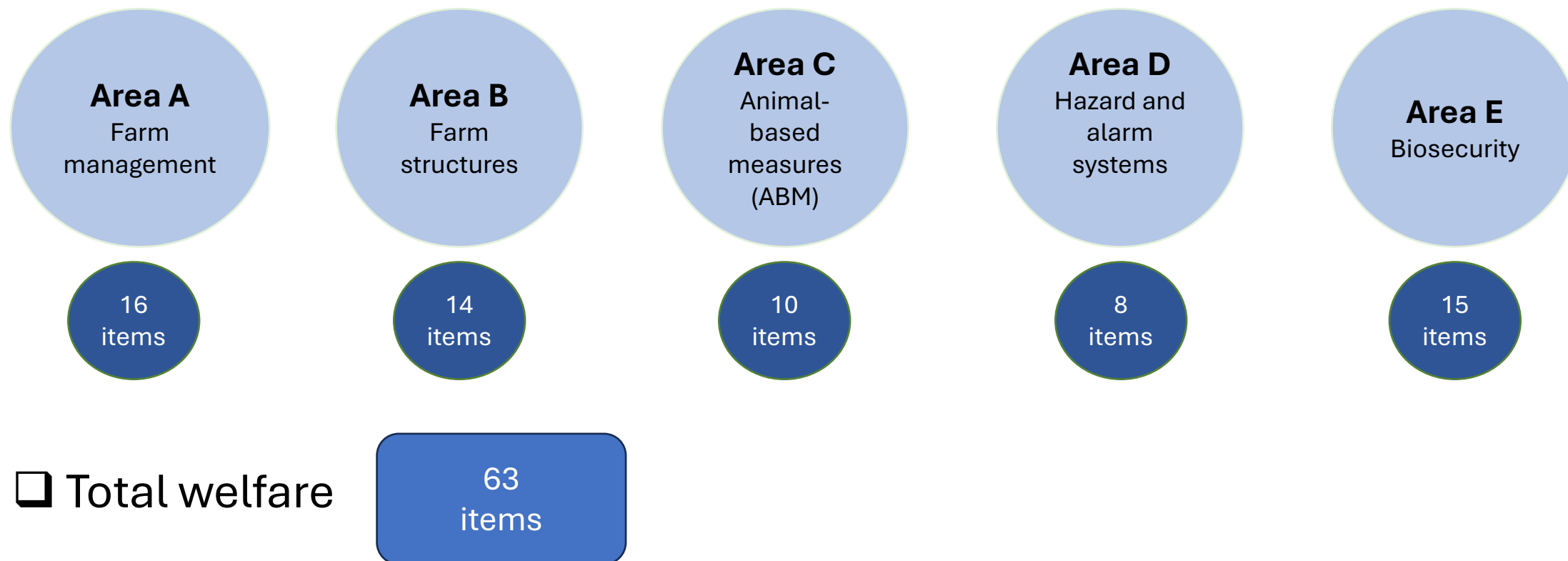
- Period of the study: April/May 2023.
- Farms: 47 DSFs from Province of Grosseto (Tuscany Region, Italy).
- **Total Sheep: 15606**
- **Breed: Sarda, Lacaune, Appenninica, Comisana, Assaf, Crossbreed**
- Milk delivered to the cooperative cheese factory.



Materials and Methods

Experimental design – Classyfarm Checklist

❑ A single operator scored farms for the five Areas



Materials and Methods

Experimental design – Classyfarm Checklist

- Item score

Not adequate (1)
Adequate (2)

Insufficient (1)
Acceptable (2)
Optimal (3)

- Area A, B, C, D, E and Total welfare score



Materials and Methods



Experimental design – Milk yield and quality

- Milk yield → quantity of milk delivered to the cooperative cheese factory in the month when data for the Classyfarm check-list were collected.
- Milk quality → average fat and protein content in the milk based on the three analyses carried out in the month when data for the Classyfarm check-list were collected.

Materials and Methods

Statistical Analysis

- A regression tree model was applied to put in evidence the cut off value for the different Classyfarm Areas.
- According to regression tree analysis results, DSFs were classified in two different groups and an ANOVA test was performed to evaluate the different score obtained from all the measured items.

Results

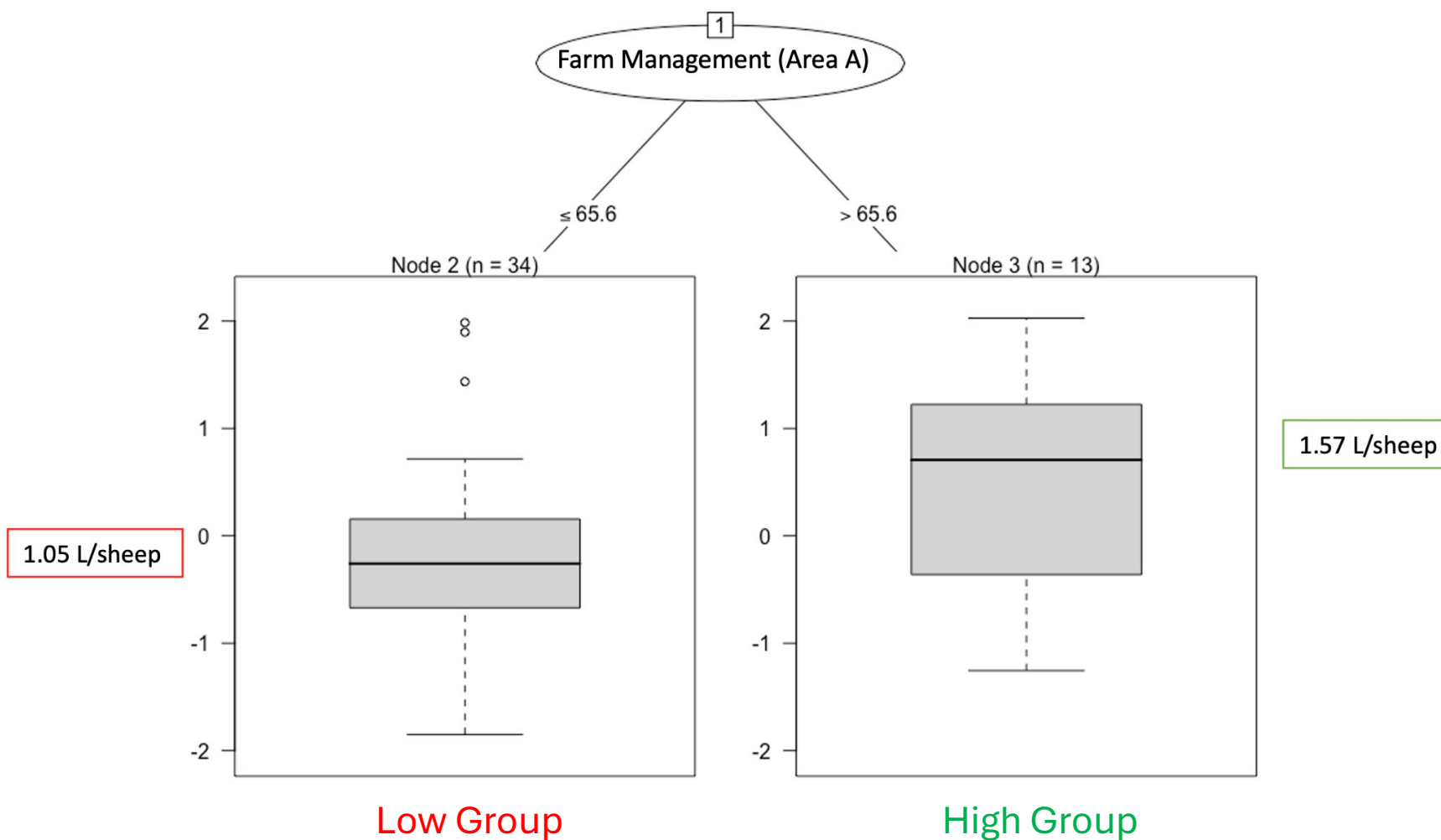
Area A (Farm management)	Area B (Farm structures)	Area C (Animal-based measures (ABM))	Area D (Hazard and alarm systems)	Area E (Biosecurity)	Total Welfare
60.6±7.2	72.0±6.3	84.1±6.5	60.6±9.8	46.0±9.2	74.0±3.5

Table 1 – Mean ± standard deviation of Classyfarm scores applied on the 47 DSFs.

Production L/Sheep	Protein	Fat
1.20±0.5	5.8±0.3	6.2±0.4

Table 2 – Mean ± standard deviation of milk yield and quality related to the 47 DSFs.

Results



Results

Score legend:

Insufficient (1)

Acceptable (2)

Optimal (3)

Area A (Farm management)					
Item	Experience in handling	Division in animal group	Feeding of animals	Hygiene of milking parlors and equipment	Management of milking operations and udder hygiene
Low Group (34 DSFs)	2.15±0.07	2.09±0.07	2.32±0.07	2.06±0.06	1.56±0.12
High Group (13 DSFs)	2.61±0.11	2.54±0.12	2.92±0.12	2.46±0.09	2.54±0.19
P-value	***	**	***	***	***

Table 3 – Square mean ± standard error of the 2 Groups for Area A.

Results

Score legend:

Not adequate (1)

Adequate (2)

Area B (Farm structures)		
Item	Presence of shelters for animals outside	Laying boxes
Low Group (34 DSFs)	1.00±0.03	1.00±0.03
High Group (13 DSFs)	1.15±0.05	1.15±0.05
P-value	*	*

Table 4 – Square mean ± standard error of the 2 Groups for Area B.

Results

Score legend:

Insufficient (1)

Acceptable (2)

Optimal (3)

Area C (Animal-based measures (ABM))	
Item	Udder health
Low Group (34 DSFs)	1.79±0.10
High Group (13 DSFs)	2.23±0.16
P-value	*

Table 5 – Square mean ± standard error of the 2 Groups for Area C.

Discussion

Farm management score is associated with milk yield in dairy sheep

- Milking management is a critical point for production and animal welfare
(Sevi et al., 2007).
- Feeding regimen and nutrient balance play a key role in modulating milk yield and quality (Cannas et al., 2019).
- Comfort and adequate indoor and outdoor structures (adequate housing, shelter at pasture etc.) promote milk productivity (Sevi et al., 2007).

Conclusions

- The application of Classyfarm checklist provides scores to classify the risk for animal welfare:
 - most common interpretation of the score = “higher is better”;
 - research is still need for a better interpretation of Classyfarm results (i.e. influence of different items, etc.).
- Results of the present study allowed to individuate a **cut-off value (65.6%)** of the score and the more relevant items associated with a **decrease of milk yield and quality in dairy sheep farms.**



Thank you



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Regione Toscana



**Caseificio Sociale
MANCIANO**
— il Pecorino in Toscana dal 1961 —