



UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI SCIENZE AGRARIE E AMBIENTALI

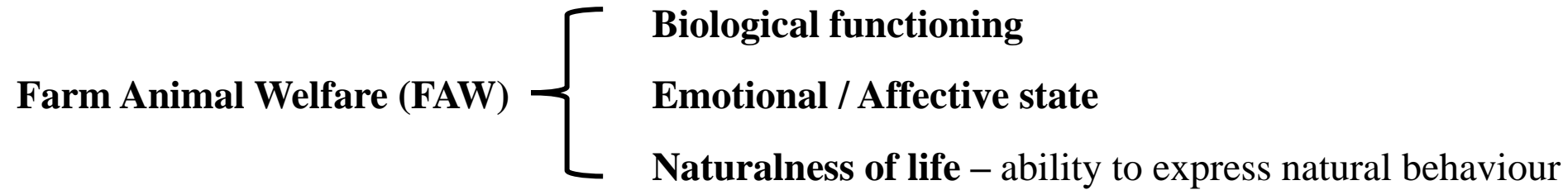
Assessing Farm Animal Welfare interest in farmers for giving up tie-stall system in Northern Italy

Chiara Mazzocchi, Lorenzo Zanchi, Luigi Orsi, Michele Zannotti, Silvana Mattiello, Monica Battini

XLIX Incontro di Studi Ce.S.E.T.

Padova, 1 dicembre 2023

Introduction



Dairy sector → debate on the effects of different **housing systems** on FAW

Tie-stall systems show:

- **higher incidence of diseases** (Hultgren, 2022; Popescu et al., 2014; Tarantola et al., 2016);
- **higher level of stress** for animals (Irico et al., 2018; Starvaggi Cucuzza et al., 2014).

➔ Chance to implement FAW-friendly technologies is influenced by technical, financial, cultural factors



Project aim

- Few studies have investigated the environmental and economic sustainability of the transition from tie to loose housing, as well as its implications on productive, behavioural and health parameters in cattle.
- This work aims at assessing **which factors, both socio-economics and ethical, can influence the maintenance of tie-stall systems in Italian dairy farms** – where this system is still common - by using a survey approach applied to dairy cow farmers using the tie-stall system.



Methodology

- Data collection took place from April to July 2023 with 87 completed questionnaires out of a total of 98 recruited dairy cattle farmers with tie-stall barns in Northern Italy (response rate: 89%). The average time to fill the survey was about 17 minutes.
- Farmers were contacted by phone, with prior agreement with producers association.
- Direct interviews led by expert interviewers, in order to facilitate the scope of the inquiry, clarifying the purpose and ensuring confidentiality.
- Data collection performed through interviewers who used survey built with Qualtrics software Ltd.



Methodology

- The factors tested in this survey include Socio-demographic, Farm-related, Opinion variables, related to the respondent's opinion on FAW and comparison between tie-stall and loose housing systems.
- The statement "I will not implement a loose housing system until it is mandatory" has been set as dependent variable.
- Given that the dependent variable — the intention to implement the loose housing system — can only assume non-negative integers ranging from 1 to 10, we considered both Poisson and negative binomial specifications.
- The backward stepwise elimination method has been employed to consider only the regressors with a statistical significance higher than 80%. This statistical procedure led to the elimination of variables below the set threshold, resulting in a final sample of 73 observations.



Data

Dependent:

"I will not implement a loose housing system until it is mandatory"

Socio-demographic variables:

- Sex
- Age
- Altimetric area
- Education
- Farmer's experience in breeding
- Farmer's family - belonging to a family of farmers

Farm related variables:

- Number of lactating cows per farm
- Average daily milk yield per cow
- Utilised agricultural area (class)
- Surface on lease
- Full time owner
- Number of employees
- Summer pasture practices
- Certified organic farming

Opinion variables (loose vs tie stall comparison):

- Effect on FAW
- Effect on milk quality
- Identification of heat
- Effect on immune system
- Labour required
- Management effort required
- Management time required
- Skills required
- Management difficulty
- Size of the herd effect
- Economic viability
- Space required
- Subsidies required for starting loose housing
- Upfront costs needed to implement loose
- Farmers' perception on business choices



Results

	<i>Dependent variable (DEP)</i>	
	Neg.Bin. (1)	PPML (2)
	Coefficient (standard error)	
Constant	3.441*** (0.662)	3.441*** (0.634)
DEM_SEX	0.387*** (0.123)	0.387*** (0.118)
DEM_AGE	-0.009* (0.005)	-0.009* (0.005)
DEM_EXP	-0.717* (0.370)	-0.717** (0.354)
FARM_MILK	-0.003* (0.002)	-0.003* (0.001)
FARM_UAA	0.085** (0.042)	0.085** (0.040)
FARM_OWNER	-0.737*** (0.177)	-0.737*** (0.169)
OPIN_AN_WEL	0.187*** (0.028)	0.187*** (0.027)
OPIN_QUA	-0.039* (0.018)	-0.039* (0.018)

Notes: Standard errors are in parenthesis. Significant levels are *** $p < 0.01$. ** $p < 0.05$. * $p < 0.1$

	<i>Dependent variable (DEP)</i>	
	Neg.Bin. (1)	PPML (2)
	Coefficient (standard error)	
OPIN_CAL	-0.046** (0.022)	-0.046** (0.021)
OPIN_MAN	-0.061** (0.026)	-0.061** (0.025)
OPIN_TIME	-0.051** (0.022)	-0.051** (0.021)
OPIN_KNOW	-0.040 (0.026)	-0.040 (0.025)
OPIN_SUBS	0.061* (0.034)	0.061* (0.032)
OPIN_COST	-0.061** (0.029)	-0.061** (0.028)
VIF max	3.44	3.44
VIF mean	1.87	1.87
Pseudo R.sq.	N.A.	0.55
Log-Lik.	-160.78	N.A.
AIC	351.57	N.A.
Observations	73	73

Notes: Standard errors are in parenthesis. Significant levels are *** $p < 0.01$. ** $p < 0.05$. * $p < 0.1$



Conclusions

Some of the variables related to farmers' opinions regarding their willingness to adopt loose-housing systems have proven to be particularly significant:

- Importance of the economic aspect, both in terms of the initial capital required for investment (OPIN_COST) and in terms of the subsidies needed for the transition from tie-stall to loose-housing systems (OPIN_SUBS);
- The sensitivity of farmers towards the topic of FAW (OPIN_AN_WEL).

Other crucial aspects in determining the choice to adopt a loose-housing system on the farm are related to the demographic characteristics of the sample:

- women are more sensitive and inclined to adopt this technology (DEM_SEX);
- more experienced farmers are less inclined toward innovation (DEM_EXP).



Conclusions

Policy implications

- Future policies should address the question of the economic viability of farm investments intended to adopt welfare-friendly technologies.
- Moreover, policies should aim to stimulate the younger generation's interest in new animal welfare management practices, considering the greater propensity of women working in agriculture toward this issue.
- However, it is important to be cautious and not to force change, as some authors (Hansen et al., 2023) argue that, for small farms, a push towards the loose-housing system could lead to the abandonment of agricultural activities, especially in mountain areas, where geographic constraints and space limits may hamper the adoption of loose-housing systems.

