

DairyCare COST Action



Scientific report for Short term Scientific Mission – STSM

STSM Applicant: Matthias Mair, University of Natural Resources and Life Sciences, Department of Sustainable Agricultural Systems, Division of Livestock Sciences (BOKU) Vienna, Austria, matthiasmair@gmx.at

STSM Topic: Welfare assessment in small scale alpine dairy farms: identification of potential risks

Host: Dr Flaviana Gottardo, Department of Animal Medicine, Production and Health, University of Padova, Italy, flaviana.gottardo@unipd.it

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STSM type: Regular (from Austria to Italy)

Purpose of the STSM:

The goal of my research was to find out how the seasonal alpine summer pasture affects health and welfare of lactating dairy cows in small scale mountain farms in Austria. I collected the data in last year visiting 25 dairy farms and applying an on farm assessment scheme (see annex 1) before, during and after alpine pasture. During each visit I collected data on animal based measures (cleanliness, hairless patches, lameness, open shoulder,...) by direct visual inspection of 451 cows and management descriptors (days on pasture, housing system, milk yield, breed,...) by interviewing the farmers.

My mission during the STSM was to organize the dataset to perform the statistical analysis with the support of the personel of the host institution Department of Animal Medicine, Production and Health – University of Padova, Italy (Prof. Flaviana Gottardo, Dr. Marta Brscic and the statistician Dr. Barbara Contiero).

Description of the work carried out during the STSM:

Together with the host, we discussed about my research questions and organised the dataset in the most appropriate way to test the hypothesis. At the beginning, we made an overview of the dataset and created PIVOT tables in Excel.

We analysed the data in order to have an overview (mean and standard deviation) for different variables available in the dataset. Moreover, different graphs helped us to analyse the distribution. A stepwise approach was then applied: study the distribution of the raw data, set the experimental unit(s) according to the type of data gathered (on farm level and on individual animal level), assess the prevalence of the animal based measures and of the resource and management based measures before, during and after the summer grazing and appropriate statistical analysis.

We carried out descriptive analyses on response and explanatory variables in SAS 9.4. Response variables are for example cleanliness, body condition and hairless patches, etc. Explanatory variables include production level, housing system, days on pasture, farm size, breed, etc.

After this first analysis we decided to create different class variables such as for example farm size (according to the number of cows present), days on pasture (according to the number of days and number of hours/day that animals spend on pasture) or production level (according to the average milk yield of the farm at the last recordings). My dataset includes just small scale farms, but there is still big variability for example in the milk yield.

Explanatory variables with a continuous distribution were also grouped into different classes, for example high production or low production. We used the median in order to define the groups. These groups were used to see how they affect the response variable.

A univariate analysis was performed to study the effect on the dependent variable of each single factor separately using a generalized linear model.

We carried out tests to find out about the significance of the main effects between the response and the explanatory variable within the assessment.

Description of the main results obtained and the dataset

The assessment includes 25 small scale alpine farms with 451 dairy cows which spent at least 3 months on alpine pasture. The prevalent breeds were Simmental (63,41%), Brown Swiss (24,83%) and Alpine Grey (11,75%). During the summer season, several factors affect animal welfare.

Variable	Unit	Assessment					
		Pre-pasture		On pasture		Post-pasture	
		Average	SD	Average	SD	Average	SD
Clinical assessment							
Animals assessed	n	451		473		474	
Normal body condition	%	91,21	13,82	97,62	5,20	97,97	3,91
Clean lower hind leg	%	91,25	13,76	97,52	5,28	97,97	3,91
Clean hind quarter	%	86,69	21,19	91,06	19,07	84,46	18,02
Clean udder	%	95,14	9,97	93,29	15,72	93,77	9,55
Absence of hairless patches on lower hind leg	%	47,40	31,29	68,27	21,67	76,86	22,98
Absence of hairless patches on carpus	%	95,42	8,36	98,33	5,30	99,42	2,08
Absence of hairless patches on rest of the body	%	90,31	11,69	93,0	10,05	96,13	7,26

Absence of lesions on lower hind leg	%	98,49	3,20	99,57	1,71	99,73	1,33
Absence of lesions on carpus	%	99,60	1,39	100,00	0,00	99,82	0,91
Absence of lesions on rest of the body	%	98,80	2,74	98,76	3,46	100,00	0,00
Absence of swellings on lower hind leg	%	99,46	1,90	99,29	2,37	98,67	3,57
Absence of swellings on carpus	%	98,68	3,67	99,91	0,45	100,00	0,00
Absence of swellings on rest of the body	%	99,34	2,27	99,50	2,50	99,91	0,47
Absence of nasal discharge	%	99,83	0,87	99,69	1,54	100,00	0,00
Absence of ocular discharge	%	100,00	0,00	98,42	4,44	100,00	0,00
Absence of diarrhoea	%	100,00	0,00	99,00	5,00	99,58	2,11
Good claw condition	%	98,47	2,74	99,29	2,40	99,62	1,37
Absence of lameness	%	89,94	8,97	91,67	7,92	93,73	5,86
Avoidance distance at feed place (ADF)							
Animals assessed	n	457		424		466	
ADF 0, touched	%	58,40	17,83	62,56	13,65	66,35	13,65
ADF from 10cm to 50cm	%	37,78	15,49	35,08	12,91	30,89	12,66
ADF ≥60	%	3,82	7,09	2,37	3,97	2,76	4,25
Rising behaviour							
Animals assessed	n	184		166		148	
Rising movement score 1 (optimal)	%	17,43	17,36	15,83	25,57	20,69	21,20
Rising movement score 2	%	60,48	19,72	37,47	20,60	65,73	17,92
Rising movement score 3	%	21,44	22,64	40,09	30,40	13,57	15,87
Rising movement score 4	%	0,64	2,40	5,36	9,38	0,00	0,00
Rising movement score 5	%	0,00	0,00	1,24	4,30	0,00	0,00

The grazing period on alpine pastures has a significant impact on some animal based measures: open shoulder (p=0,036), abnormal body condition (p=0,019), hairless patches on lower hind leg (p=0,001) and hairless patches on the rest of the body (p= 0,032).

	Pre-pasture	On-Pasture	Post-pasture	P<
open shoulder	-	6,77%	1,27%	0,036
abnormal body condition	7,52%	1,90%	2,10%	0,019
hairless patches on lower hind leg	53,98%	56,02%	24,47%	0,001
hairless patches on the rest of the body	10,61%	7,61%	3,70%	0,032

The housing system has a significant impact on hairless patches at lower hind leg ($p=0,010$). Cows in tie stall systems had a higher prevalence of hairless patches at lower hind leg than those in loose housing systems.

	Tied stall	Loose housing	P<
hairless patches on lower hind leg	45,05%	5,82%	0,010

If a cow is lactating or dry, has a significant effect ($p=0,026$) on the dirtiness of the hind quarter of a cow.

	Lactating cows	Dry cows	P<
dirtiness of the hind quarter	12,70%	16,03%	0,026

Acknowledgements

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