

Monitoring stress behaviour in grazing beef cows



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Introduction (1)

Extensive grazing system

- Control
- Lack of technology
- Long production cycle – delayed information



Introduction (2)

Hierarchical order

High ranking cows

- Stable
- Priority of access to limited resources

Low ranking cows

- Small, unstable societies
- Social stress is common



Research goal

- **Creating a management tool to identify socially stressed cows (low ranking cows)**
- in order to:
 - improve grouping strategy
 - improve resource allocation



Dividing by rank

- **Evaluation of agonistic behaviour in pasture and near the food**
- **validation by Cortisol level**
- **N = 26**
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Materials and methods (1)



- ❖ Track A))) cow system
- ❖ Long range transmitting tags (leg & neck)
- ❖ Transmission range: 600-2000m approximately
- ❖ 433 MHz ultra long range radio frequency
- ❖ Frequent, real-time data transfer
- ❖ More timely information than other systems
- ❖ Data: Activity, posture, visits to the food trough, duration of visits



Animal sensing in pasture

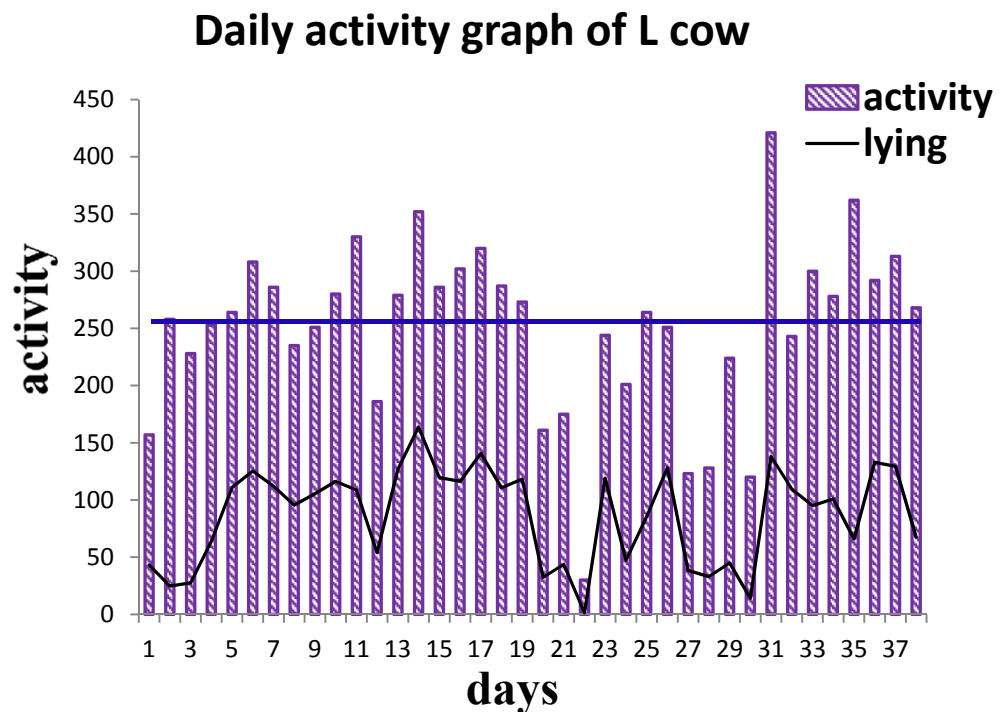
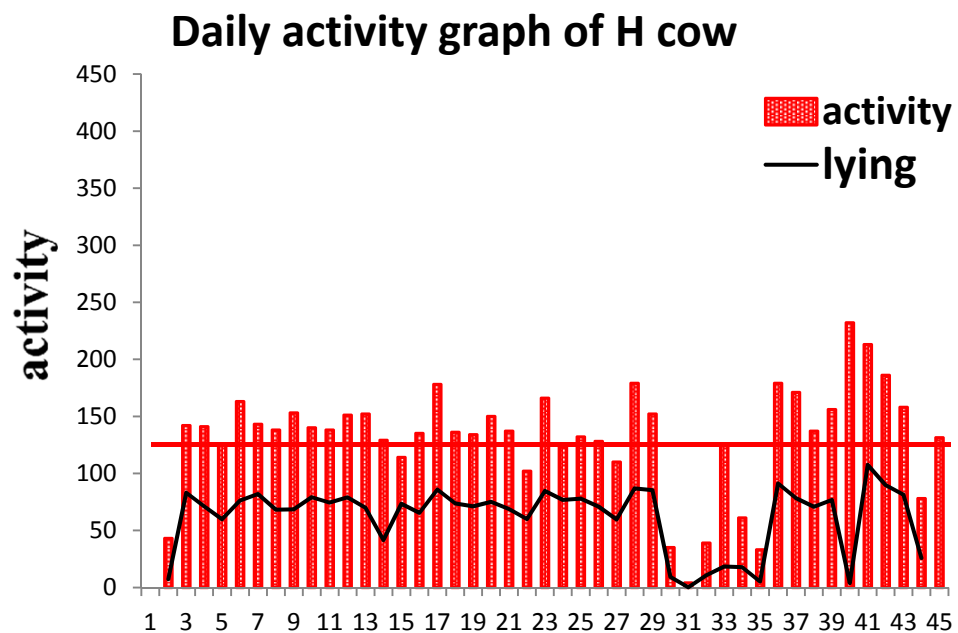


Results (1)

General observed pattern

- **Group behaviour seemed steady**
- **CV values for hourly & daily activity:
48 \pm 8% and 44 \pm 9% respectively**
- **Continuously changing individual activity**

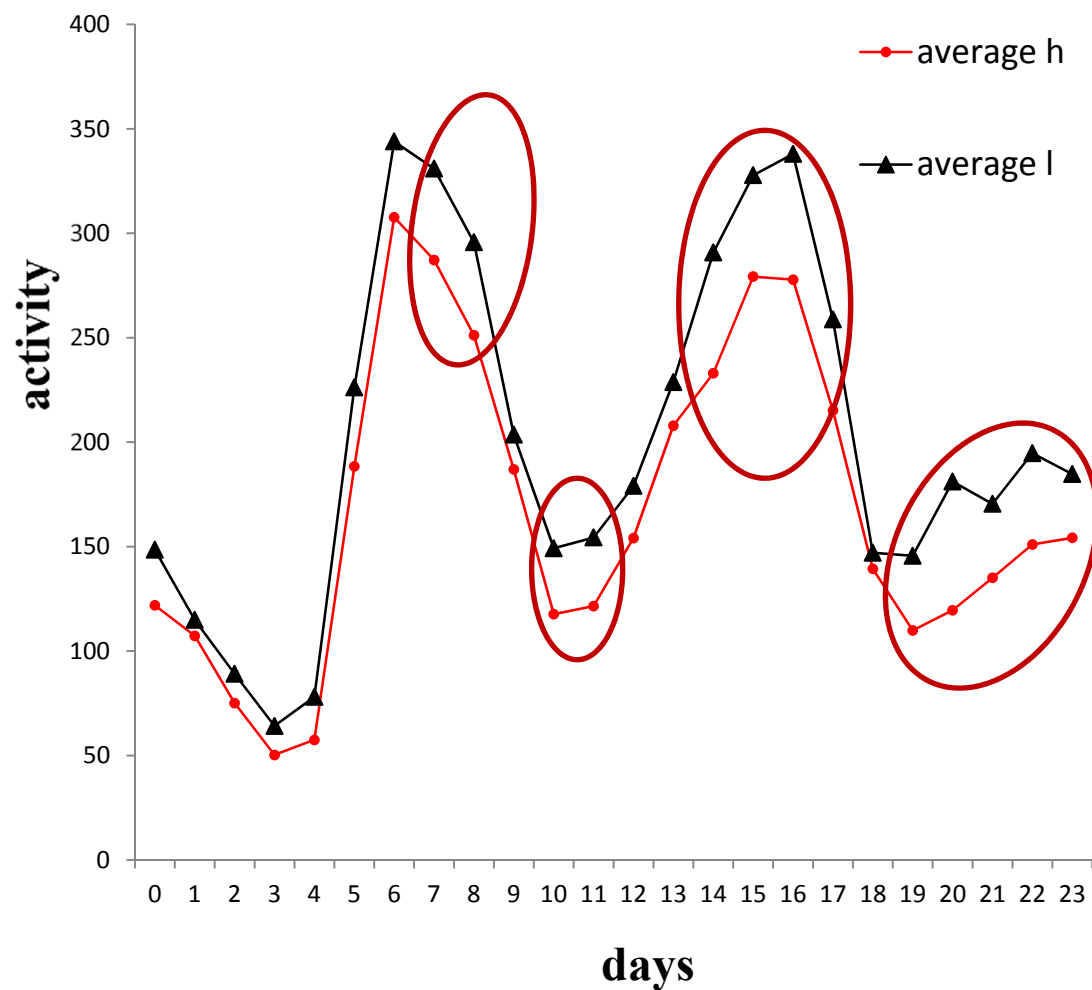




	High ranking cows (H)	Low ranking cows (L)	P value
<i>Average daily activity</i>	138±29	151±41	0.177
<i>Average hourly activity</i>	182±38	174±19	0.79
<i>Graph amplitude</i>	136±37	168±65	0.08
<i>graph amplitude * average daily activity mean mean</i>	223	260	0.029



Average hourly activity of H and L cows



Hour	High ranking cows (H)	Low ranking cows (L)	P value
07:00	286 \pm 42	337 \pm 79	0.05
08:00	250 \pm 34	300 \pm 69	0.03
10:00	116 \pm 39	153 \pm 40	0.02
11:00	121 \pm 26	158 \pm 49	0.03
14:00	233 \pm 52	297 \pm 85	0.03
15:00	280 \pm 44	333 \pm 76	0.04
16:00	277 \pm 46	345 \pm 83	0.02
17:00	214 \pm 42	264 \pm 78	0.05
19:00	109 \pm 42	150 \pm 46	0.02
20:00	121 \pm 50	188 \pm 81	0.02
21:00	135 \pm 48	174 \pm 49	0.03
22:00	151 \pm 42	200 \pm 52	0.02
23:00	156 \pm 38	188 \pm 45	0.04

Results (2)

Production

- **Average daily gain until weaning tended to be different (1.21 ± 0.2 and 1.09 ± 0.16 ; $P = 0.07$) for high and low ranking cows respectively**



Summary

- **Socially stable herd**
- **Variable individual behaviour**
- **High ranking cows manage to establish a more routine activity**
- **Detection of social stress by coupling activity level and fluctuations**
- **Individual continuous resolution is essential**
- **Definition of “where” and “when” stress occurs**
- **Wireless pedometer system allows precision in extensive cattle system**



Take home message

- Cows activity varies continuously
- Sampling is ineffective
- Definition of place and time for “bottle necks”
- Individual attitude



Acknowledgements



- The Israeli extension service
- ENGS systems
- All creatures – high and low ranking



Thank you!



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Preliminary results- Variable age charolais cows – 180 days

	heifers	mature
average activity	91±48	75±29
p value	0.0001	

heifers 
mature 

Activity

