

RSPCA Hugh Wirth Scholarship: Annual Progress Report 2020

Addressing the consequences of social deprivation experienced by artificially-reared dairy heifers: providing older social models for improved welfare, social and cognitive outcomes.

Laura Field: Animal Welfare Science Centre, University of Melbourne

This research explores the potential for enriched social environments to improve heifer development and welfare, primarily through an experiment investigating the effects of rearing dairy heifers with adult dry cows as social models on calves' development. Forty dairy heifers were mixed into groups of 10 at 2 weeks of age, and one of two treatments were applied until 13 weeks: 1. Hand-reared, group-housed calves (-S), or 2. Hand-reared, group-housed calves housed with 3 non-familial dry cows (+S). All groups were housed on pasture and fed 3L whole milk twice/day. The experimental farm is in the North-West of Tasmania. Calves were successfully reared within these treatments from August- November 2019, and initial testing was undertaken. The calves were weaned and since November, have been living in the research farm's replacement heifer farm.

The initial stages of this project (including the treatment period and initial behavioural testing) were funded through alternative sources, while the funding provided by RSPCA Australia is intended to support long-term behavioural and physiological testing and behavioural data analysis of videos. This includes cognitive and social testing that was originally scheduled for March-April 2020, which was delayed due to the current global pandemic, and is now scheduled to be completed in early September 2020. The additional testing and observation of behavioural responses to insemination and other management procedures were also scheduled to be conducted toward the second half of September 2020. With the recent announcement of Melbourne's Stage 4 lockdown extending to mid-September, this upcoming testing will likely again be delayed as the primary researcher resides within the city and Tasmanian borders are closed. The project budget does not extend to pay casual staff for the amount of time that would be necessary for this testing to be completed without the primary researcher. The heifers cannot be tested during the period 25 September- 25 December 2020 as they will be within the farm's breeding program, thus in all probability, testing will be delayed until January-February 2021. The main data collection period remains as July-August 2021 when the experimental heifers will join the milking herd for the first time.

Hurdles aside, the initial stages of the experiment and treatment period, funded through alternative sources, were successful, and preliminary results from the initial testing suggest a treatment effect. These preliminary results were presented at the 2020 Dairy Research Foundation Symposium, winning Best Abstract in the Emerging Scientist competition. This initial testing explored calf responses to social isolation in an enclosed arena when they were 12 weeks old. Following a 5-minute habituation period in groups of 5 conspecifics, calves were individually tested, and behaviour was continuously recorded for 4 minutes. Data for 10 calves were collected and analysed using a Mann-Whitney U Test to compare the behavioural responses of -S and +S calves to social isolation. Median values are reported with ranges. When compared with +S calves, -S calves walked more frequently (-S=12, range 7-15 vs +S=6, range 2-10 bouts, $p=0.016$) and for a longer duration (-S=52.85s, range 23.0-64.9s vs +S=16.6s, range 2.5-47.5s, $p=0.032$), and displayed vigilance behaviour more frequently (-S=4, range 2-6 vs +S=0, range 0-2 bouts, $p=0.08$) and for a longer duration (-S=38.0s, range 12-70.8s vs +S=0s, range 0-21.3s, $p=0.016$). This suggests -S calves perform more stress-associated behaviours when subjected to isolation, possibly indicating lower independence and stronger motivation for social reinstatement.

While it has not yet been possible to utilise the funding provided by RSPCA Australia and obtain further results, these preliminary results are promising for when further research is able to finally take place, as they suggest that providing dairy heifers with exposure to social models during early life may improve calves' behavioural responses to stressful social situations. The funding provided by RSPCA Australia will be used to collect further data exploring these results once researchers are able to return to the experimental animals and resume testing.