THE UNIVERSITY of EDINBURGH
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ROSLIN

Calf management: *The effect of single and paired housing on dairy calf health and welfare*

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Why rear calves in pairs?

Recent research indicates;

Individual reared calves have:

- Deficient social skills
- Struggle to cope with novel situations
- Poorer learning abilities

Paired or grouped housed calves have improved:

- Solid feed intakes
- Growth rates
- Better learning ability

Why rear calves in pairs?

Supermarket and Consumer demand

- Some milk contracts now require farmers to house calves in pairs or group housing

- Consumer pressure- some don't like the idea of calves being reared in isolation.

Why rear calves in pairs?

- Area of current scientific interest
- More research currently needed to find what type of environment and management best suits the calf
- Limited research based on UK dairy farms

Why is this project different?

1. No significant differences found in some studies potentially due to the low number of calves used
   132 calves in this study

2. The age at when comparisons are made between paired and individually reared calves is different to the majority of studies
   2-4 weeks in this study

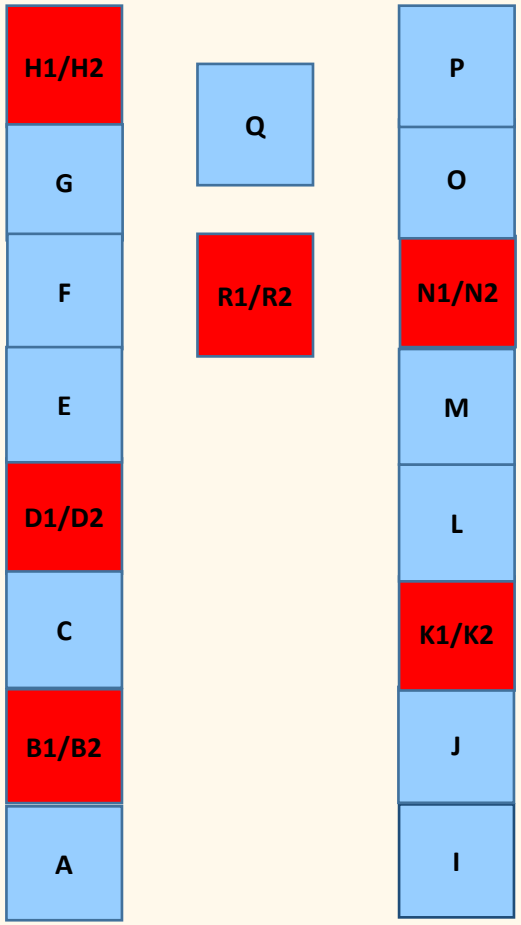
3. Low number of studies focusing on how calves adapt to new environments such as batching in larger groups

4. One of few studies based in UK

Farm background and study design

- 450 cow Holstein herd milking twice daily
- Peak calving through the autumn months, rearing all heifer calves

Study design



RED=SINGLE

BLUE=PAIRED

1.67m² pen space per calf

1:1 ratio paired pens to single pens

Study design

Study Design

- Holstein heifer calves penned in order they are born

- Calf 1-single
- Calf 2 and 3-pair
- Calf 4-single
- Calf 5 and 6-pair

- Fed 4 litres twice daily while in calf pens, with fresh water and starter concentrate available from birth

- Calves batched at around 2 - 4 weeks of age in batches of 12

Batching

8 paired calves and 4 single calves in each batch

11 batches in total

What are we measuring?

- Daily Live Weight Gain (DLWG)
- Mortality and Treatment
- Saliva Cortisol
- Latency to feed
- Latency to approach a novel object

Timeline

Project run from 14/09/21 to 06/03/2022

BATCHING

Day before batching

- Saliva cortisol sample 10am-Timepoint 1
- Weighed
- Individual marking

Day of batching

- Calves moved to batch at 9.15am
- Saliva Cortisol sample 10am-Timepoint 2
- Latency to approach a novel object
- Latency to feed (first feed after batching)

Day after batching

- Latency to feed (second feed after batching)
- Saliva cortisol sampling 10am- Timepoint 3

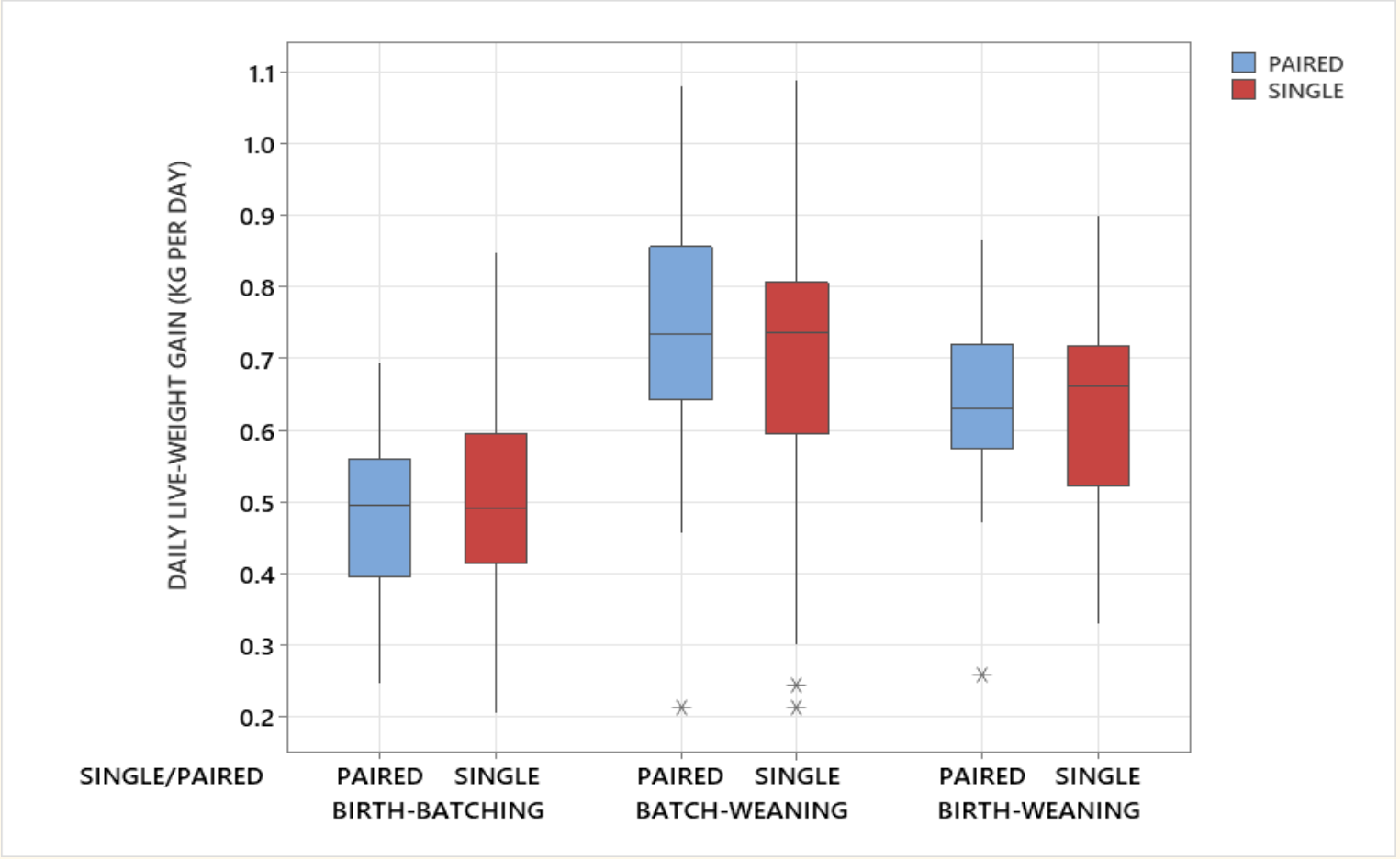
On farm recording sheet

Calf ID	Weight one day before batch	Pre-batch pen	Post-batch pen	CALF NUMBER	CALF COLOUR 1	CALF COLOUR 2
1450-1	65.4	M	T	25	RED	YELLOW
1451-2	57.4	M	T	26	RED	SILVER
1452-3	62.2	N1	T	27	RED	GREEN
1453-4	56.6	N2	T	28	RED	RED
1454-5	62.4	O	T	29	SILVER	RED
1455-6	70.2	O	T	30	SILVER	SILVER
1456-7	62.4	P	T	31	SILVER	YELLOW
1457-1	50.6	P	T	32	SILVER	GREEN
1458-2	53.4	Q	T	33	YELLOW	RED
1460-4	61.2	Q	T	34	YELLOW	SILVER
1461-5	58.0	R1	T	35	YELLOW	GREEN
1459-3	64.0	R2	T	36	YELLOW	YELLOW

Colour marking helps remove bias, as cannot identify paired/ single calves on video

Results

Daily Live Weight Gain



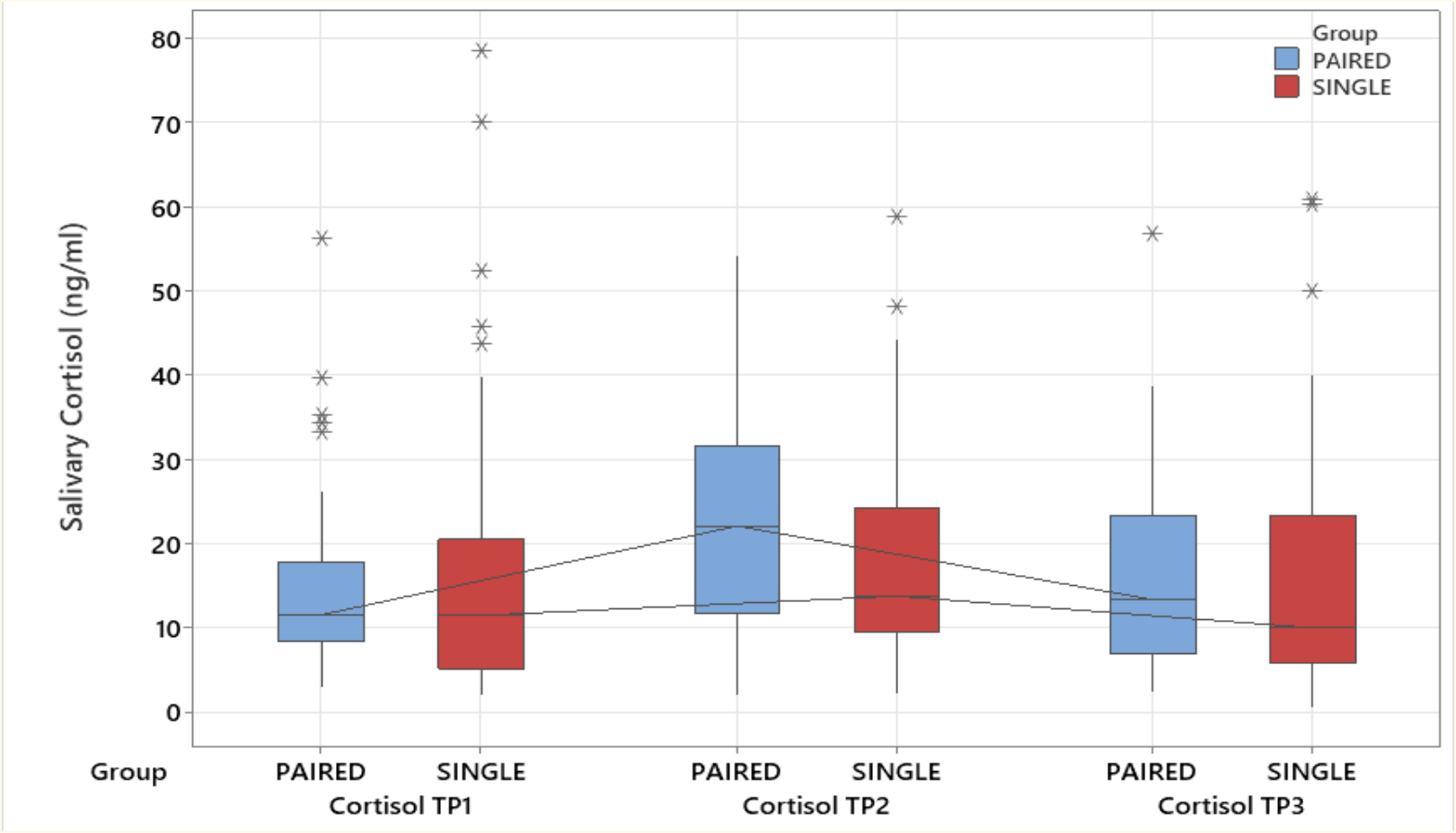
	Single ADLWG	Paired ADLWG	P-Value
Birth- Batching	0.50	0.48	0.362
Batching-Weaning	0.70	0.74	0.401
Birth-Weaning	0.62	0.64	0.516

Mortality and Treatment

	Mortality %
Paired	2
Single	2

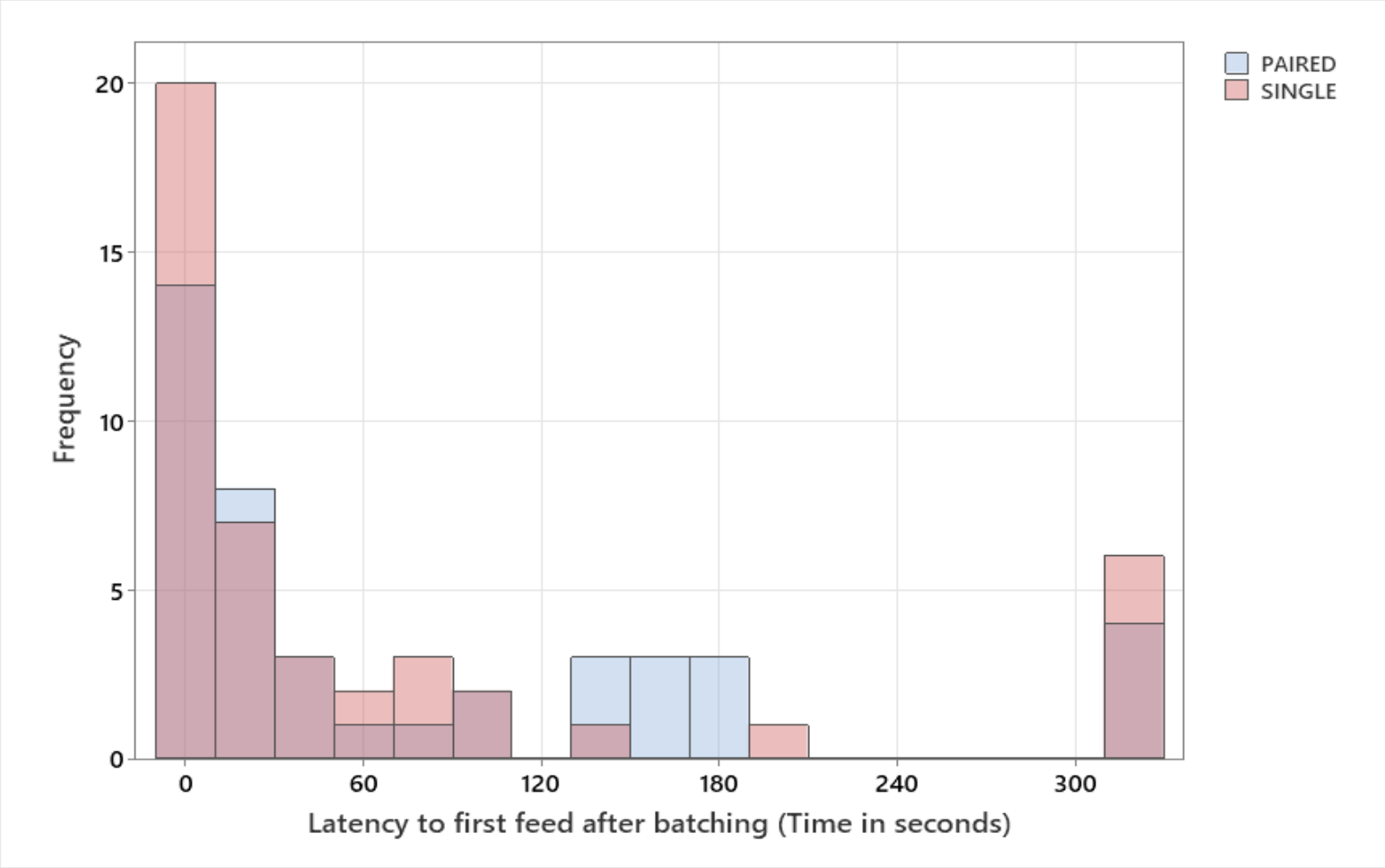
	Diarrhoea	Pneumonia	All Treatments
Paired % treated	79%	19%	88%
Single % treated	69%	24%	80%
P-Value	0.306	0.543	0.301

Saliva Cortisol



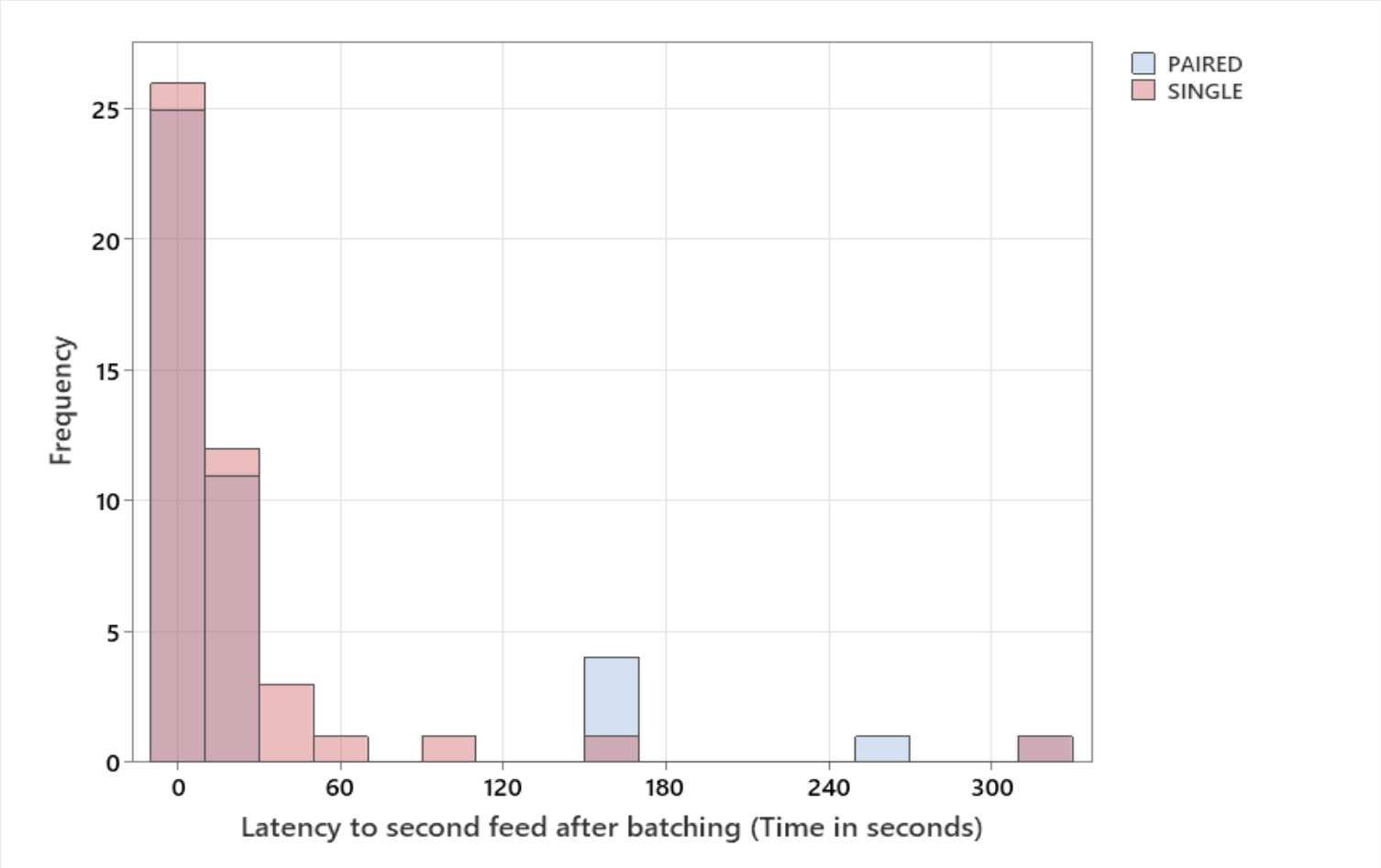
Cortisol	P-Value
Timepoint 1	0.610
Timepoint 2	0.056
Timepoint 3	0.465

Latency to first feed after batching



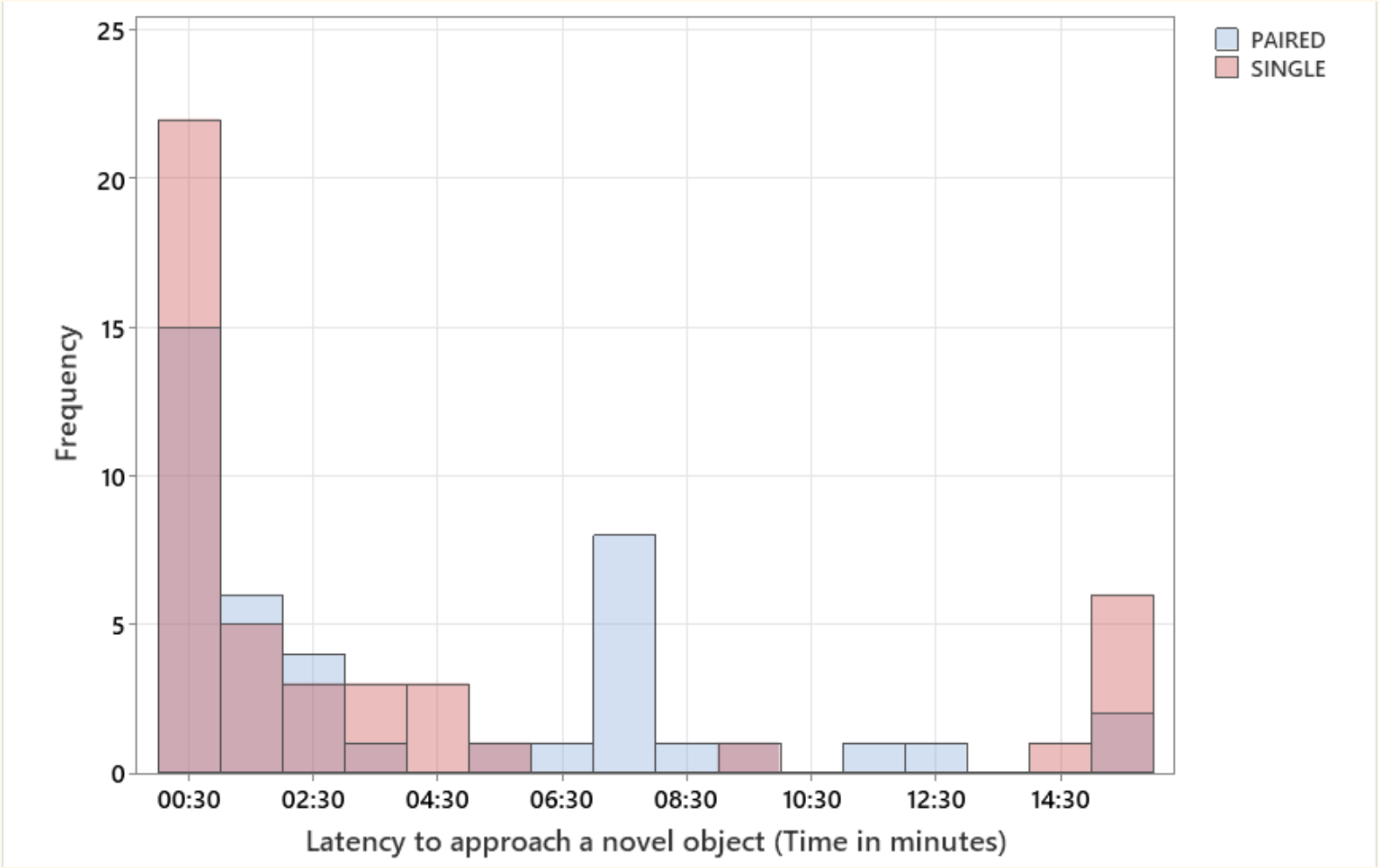
	P-value
Latency to first feed after batching	0.304

Latency to second feed after batching



	P-value
Latency to second feed after batching	0.932

Latency to approach a novel object



	P-value
Latency to approach a novel object	0.260

Conclusions

This study found no detrimental effects of housing calves in pairs compared to single housing under typical UK dairy farm conditions.

This study used the average measurement for a pen of paired calves, similar to other research studies.

Next step? Should the paired calves be assessed individually rather than an average?

Special thanks

Any questions?