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Feeding and transport of bobby calves

Ellen Jongman

AWSC





Bobby calves in Australia

- ◆ Bobby calves are largely male dairy calves
- ◆ Low value, by-product of milk production
- ◆ Seasonal
- ◆ Slaughtered around 5 days of age
- ◆ Transported for up to 10 hours
- ◆ Off feed for up to 30 hours
- ◆ Often difficult to handle as a group



Factors that may affect welfare outcomes

- ◆ **Colostrum and feeding management**
- ◆ **Conditions in holding yards**
- ◆ **Total duration of travel**
- ◆ **Stocking density during transport**
- ◆ **Flooring in truck**
- ◆ **Handling during loading, unloading and at the abattoir**
- ◆ **Age at transport**
- ◆ **Total time off feed**



The effect of feeding practices

- ◆ Calves are fed either once or twice/day
- ◆ Recommended amount is 10% of body weight
- ◆ Naturally calves feed 5-12 times/day
- ◆ From 2 days old calves may drink as much as 20% of body weight



Aims

- ◆ **To compare once and twice daily feeding of calves up to 8 days old**
- ◆ **To compare feeding 10% (~4 l) compared to 20% (~8 l) of body weight.**



Treatments

Calves from 3 to 8 day old were fed milk replacer either once or twice daily.

- 1) 10% of body weight daily over one meal (1 x 10%);
- 2) 10% of body weight daily over two meals (2 x 5%); or
- 3) 20% of body weight fed over two meals (2 x 10%).

At the start of the experiment calves were an average of 44kg bodyweight



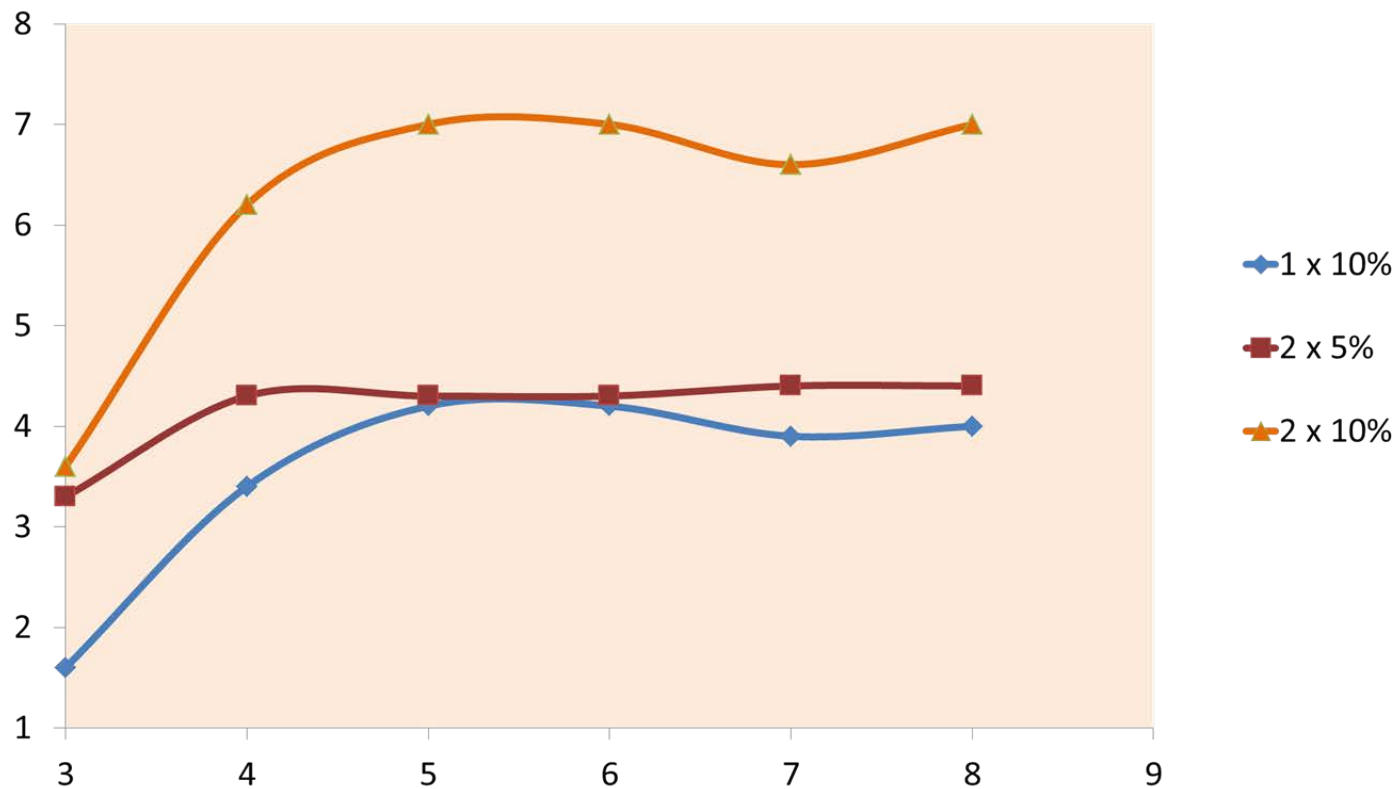


Measurements

- ◆ Milk intake at each meal
- ◆ Daily bodyweight
- ◆ Behaviours: time spend drinking, time spend sucking when no milk is present (non-nutrient), time spend lying.
- ◆ A novel arena test was conducted as a measurement of alertness and exploration.
- ◆ Blood samples were taken on days 4 and 8 for a 24hr period. Blood samples were analysed for glucose, NEFA, cortisol, PCV, insulin and beta-hydroxybutyrate.



Daily milk intake (l) from 3 to 8 days old



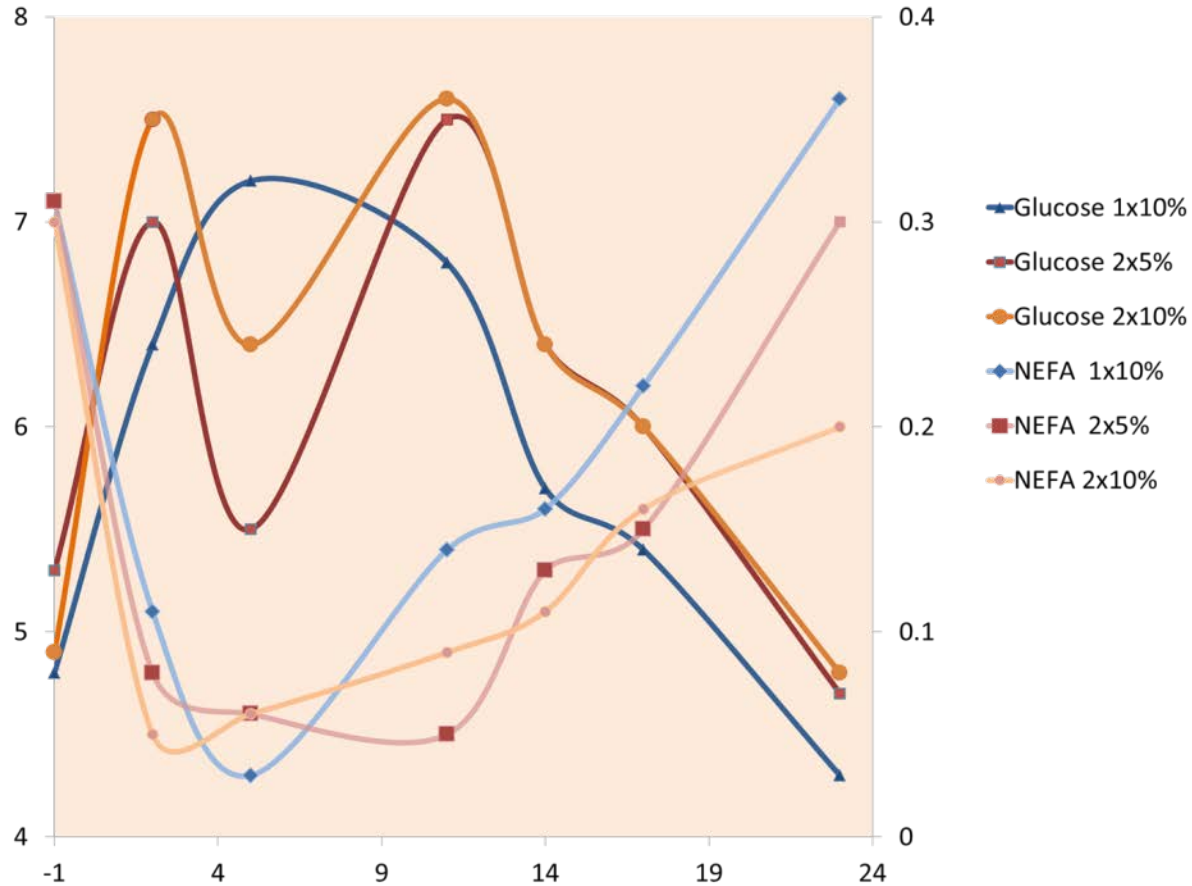


Non-nutrient sucking

Measurement	1 x 10%	2 x 5%	2 x 10%	P Value
<i>Day 3</i>				
Bouts	11	13	12	0.83
Time	620	770	740	0.78
<i>Day 7</i>				
Bouts	11	22	10	0.0023
Time	480	1260	490	0.00060



Concentrations of glucose (mmol/l) and NEFA (mmol/l) of calves at 8 days old





Conclusion

- ◆ Feeding twice daily offers benefits to calves up to day 4 of life when feeding to 10% of bodyweight
- ◆ Feeding 20% of bodyweight (over 2 meals) was beneficial after day 4 to satisfy feeding motivation and nutrition for growth.



Transport of bobby calves

- ◆ **Transported at 5 days of age**
- ◆ **Transported up to 10 hours**
- ◆ **Off feed for up to 30 hours**
- ◆ **Conditions during transport/saleyard**
- ◆ **Handling during (un)loading and at the abattoir**



Effect of age, flooring and stocking density during road transport of bobby calves





Animal Welfare Code of Practice

- ◆ Calves need to be at least in their 5th day of life to be transported for slaughter
- ◆ Younger calves may be transported for a maximum of 6 hours to a breeding facility, however bedding needs to be provided
- ◆ Calves need to be given sufficient space to lie down, although a specific space allowance is not prescribed



Objective

The objective of this study was to identify the space allowance requirements for transport of bobby calves and to understand factors such as age and flooring that minimise risks to welfare during transport of bobby calves.



Methods

- ◆ Dedicated truck with movable compartments, transport for 12 hours
- ◆ Stocking densities: 0.2 m², 0.3 m², 0.5 m²
- ◆ Age: 3, 5 and 10 day old
- ◆ Flooring: straw, mesh, solid
- ◆ A total of 432 male calves were transported during 12 trips over 2 years
- ◆ Average weight was 38kg



Calves in transport





Measurements

Blood samples

- prior to loading,
- after unloading and
- after recovery

Glucose, packed cell volume (PCV), beta-hydroxybutyrate (BOHB), creatin kinase (CK)

Lying behaviour during transport (video observations)

Behaviour for 12 hrs during recovery after transport



Effect of age on behaviour and physiology before, during and after transport, and after 12 hours of recovery

Measurement	3 days	5 days	10 days	P value
Lying (%)	59	48	42	3.0×10^{-5}
Glucose				
Pre loading	6.9	6.1	6.2	0.016
After transport	6.2	5.8	5.8	0.037
After recovery	4.5	4.2	4.2	0.081
Drinking bouts at Recovery	1.0	1.8	3.3	9.1×10^{-6}



Effect of **flooring** on behaviour and physiology during and after transport and after 12 hours of recovery

Measurement	Solid	Mesh	Straw	P value
Lying (%)	41	45	63	0.00012
CK				
After transport	240	330	180	0.0045
After recovery	170	200	130	0.0085



Results

Measurement/space	0.2m ²	0.3m ²	0.5m ²	P value
Time spend lying (%)				
during transport	52	45	52	0.069
Lying (%) sd	20	13	12	<0.001
Posture changes	10	16	17	<0.001
CK value				
-After 12h transport	490	200	150	<0.001
-After 12h recovery	260	130	110	<0.001



Conclusions (age and flooring)

- ◆ 3-day old calves lie down more than older calves during transport, therefore a comfortable area to lie down may be more important for these calves
- ◆ Calves lie down more on straw bedding compared to solid or mesh flooring



Conclusions (space allowance)

- ◆ Total lying time did not differ between space allowance treatments
- ◆ Higher variation in lying behaviour and less posture changes with less space indicates that calves with a space allowance of 0.2m^2 were not able to lie down and get up unobstructed.
- ◆ The large increase in CK after transport at 0.2m^2 may indicate either increased bruising or increased muscle fatigue.
- ◆ Therefore the variation in lying behaviour and the number of posture changes provide additional information on comfort during transport.
- ◆ The results would suggest that calves should be transported at a space allowance of at least 0.3m^2 .

