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Dairy cows' social rank influences their drinking behavior

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Sufficient access to clean drinking water is essential for the productivity and welfare of dairy cows



- Climate change ↗ heat waves → Thermal stress ↘ health and welfare
- Providing water to cows ↔ high variability between farms...
...can ↗ competition + agonistic interactions ↘ drinker access of certain cows

Do all the cows in a herd have sufficient access to water, whatever their social rank?

METHODS

22 cows, 6 electronic drinkers: 3.6 cows/drinker VS 10 cows/drinker (Welfare Quality, 2009)

Agonistic interactions: 7 cameras, 9 analyzed days (from 5:30 to 22:00)

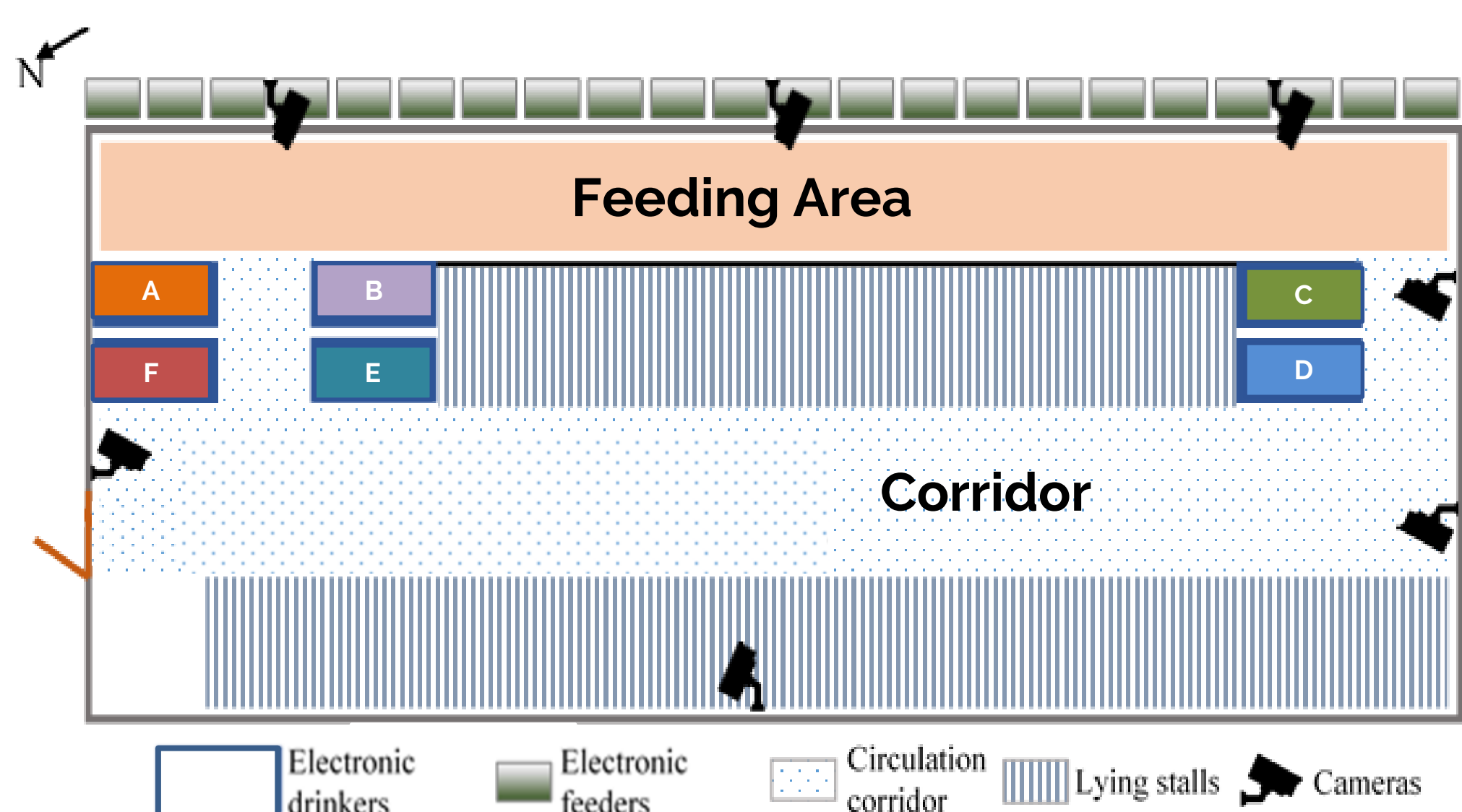


Figure 1: experimental pen layout

- Determined **social categories** based on quantiles of the **replacement** hierarchy
- Analyzed the effect of **social category**, **hour of the day** and **drinker** on the **daily water intake** of cows.

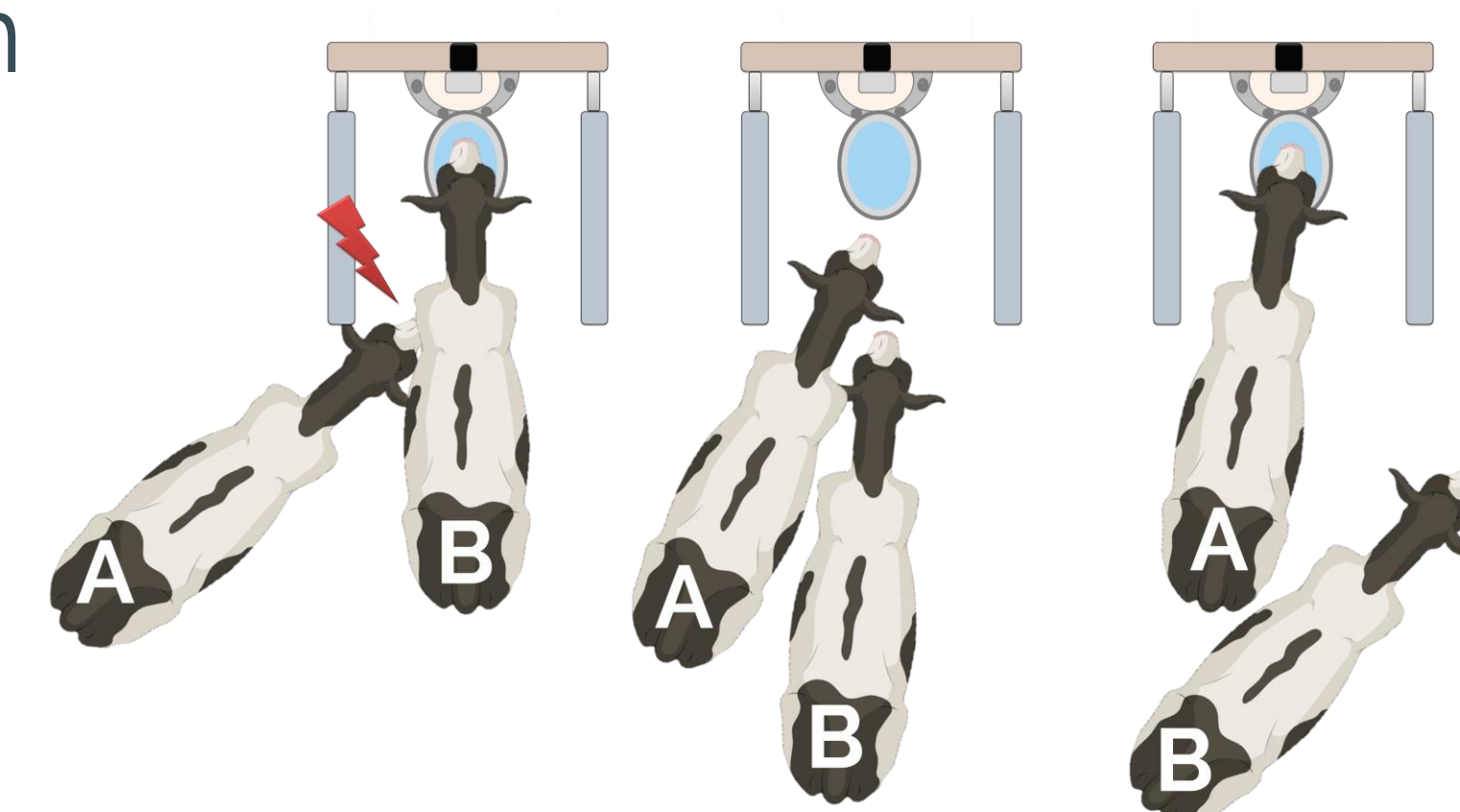


Figure 2: Replacement

RESULTS

Drinking proportion per drinker

By social category:

- ❖ E Mid subordinates > Subordinates
- ❖ A Mid dominants > all others
- ❖ B Dominants > Subordinates
- ❖ D Subordinates and Mid sub. > Dominants

For the whole group:

- ❖ Low in F and high in C

- **Two peaks** of water consumption
- Significant **differences** in water intake **between social categories** at 12:00, 18:00, 20:00 and 21:00
- **Subordinate** cows drink 2 to 3 hours after the peaks

Hourly drinking dynamics by social category

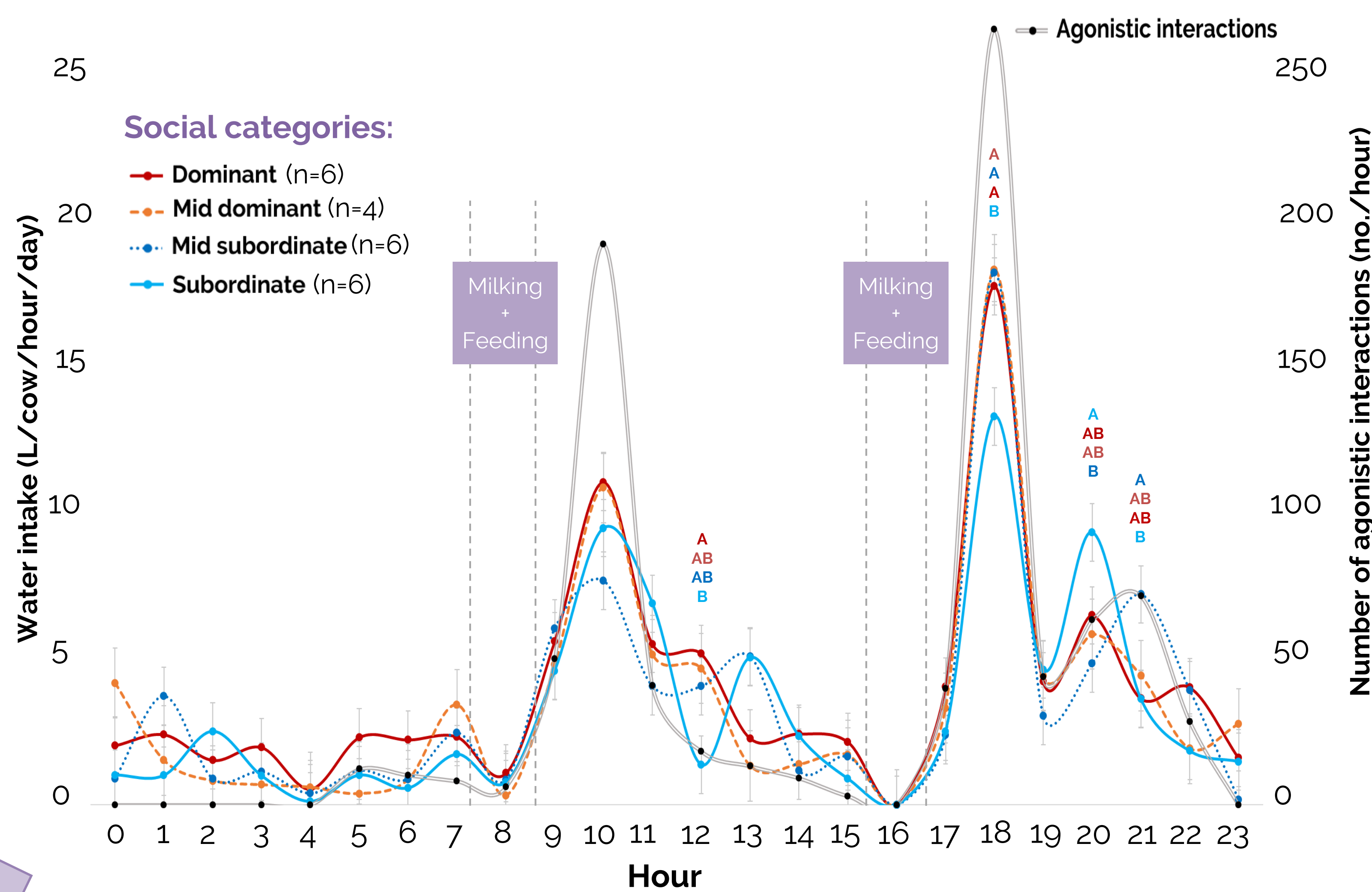


Figure 3: Hourly drinking behavior of the cows according to their social category and hourly number of agonistic interactions in the pen

CONCLUSION

The social hierarchy influences the hourly dynamic of drinking of the cows...
... **subordinates drink differently than other social categories**

Even with a great number of drinkers available:

- **Two great peaks of competition for water** during the day
- **Cows used different drinkers according to their social category**

Knowing the existence of social hierarchy and individual variability in drinking behavior...

... **it is essential to provide a comfortable number of drinkers at different locations on farms**