Longitudinal retrospective study of intake recovery and growth in unweaned dairy beef calves subjected to fasting, transport, and entire commercialization at farm arrival.

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Generalitat de Catalunya
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DAIRY BEEF PRODUCTION:
HOT TOPIC WORLDWIDE

frontiers in Veterinary Science
ORIGINAL RESEARCH
published: 18 December 2020
doi: 10.3389/fvets.2020.576469

J. Dairy Sci. 104:3789–3819
https://doi.org/10.3168/jds.2020-19519

Invited review: Beef-on-dairy—The generation of crossbred beef × dairy cattle

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Transport of Young Veal Calves: Effects of Pre-transport Diet, Transport Duration and Type of Vehicle on Health, Behavior, Use of Medicines, and Slaughter Characteristics

Francesca Marcato [1,2], Henry van den Brand [1], Bas Kemp [1], Bas Engel [3], Maaike Wolthuis-Fillerup [2] and Kees van Reenen [2]*

Science
REVIEW
published: 16 April 2021
doi: 10.3389/fvets.2021.645537

Factors Affecting the Welfare of Unweaned Dairy Calves Destined for Early Slaughter and Abattoir Animal-Based Indicators Reflecting Their Welfare On-Farm

https://www.frontiersin.org/articles/10.3389/fvets.2021.645537/full

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J. Dairy Sci. TBC
https://doi.org/10.3168/jds.2024-25011

A randomized controlled trial evaluating the effect of providing a rest period during long-distance transportation of surplus dairy calves: Part I. Impact on health, growth, and activity.

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J. Dairy Sci. 105:2572–2586
https://doi.org/10.3168/jds.2021-20878

Simulation of feed restriction and fasting: Effects on animal recovery and gastrointestinal permeability in unweaned Angus-Holstein calves

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Agricultural Systems 186 (2021) 102936
Contents lists available at ScienceDirect
Agricultural Systems
journal homepage: www.elsevier.com/locate/agsy

Short Communication

Reducing greenhouse gas emissions of New Zealand beef through better integration of dairy and beef production

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animals
MDPI

Review

Strategies for Feeding Unweaned Dairy Beef Cattle to Improve Their Health

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J. Dairy Sci. 106:3548–3558
https://doi.org/10.3168/jds.2022-22752

Livestock haulers' views about dairy cattle transport in Atlantic Canada

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Translational Animal Science, 2022, **6**, 1–21
https://doi.org/10.1093/tas/txac025
Advance access publication 9 February 2022
Symposia
OXFORD
AMERICAN SOCIETY OF ANIMAL SCIENCE

Board Invited Review: Crossbreeding beef × dairy cattle for the modern beef production system

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J. Dairy Sci. 106:2800–2818
https://doi.org/10.3168/jds.2022-22367

A randomized controlled trial investigating the effect of transport duration and age at transport on surplus dairy calves: Part II. Impact on hematological variables

H. M. Goetz,[1] K. C. Creutzinger,[2] D. F. Kelton,[1] J. H. C. Costa,[3] C. B. Winder,[2] D. E. Gomez,[4] and D. L. Renaud[1]*
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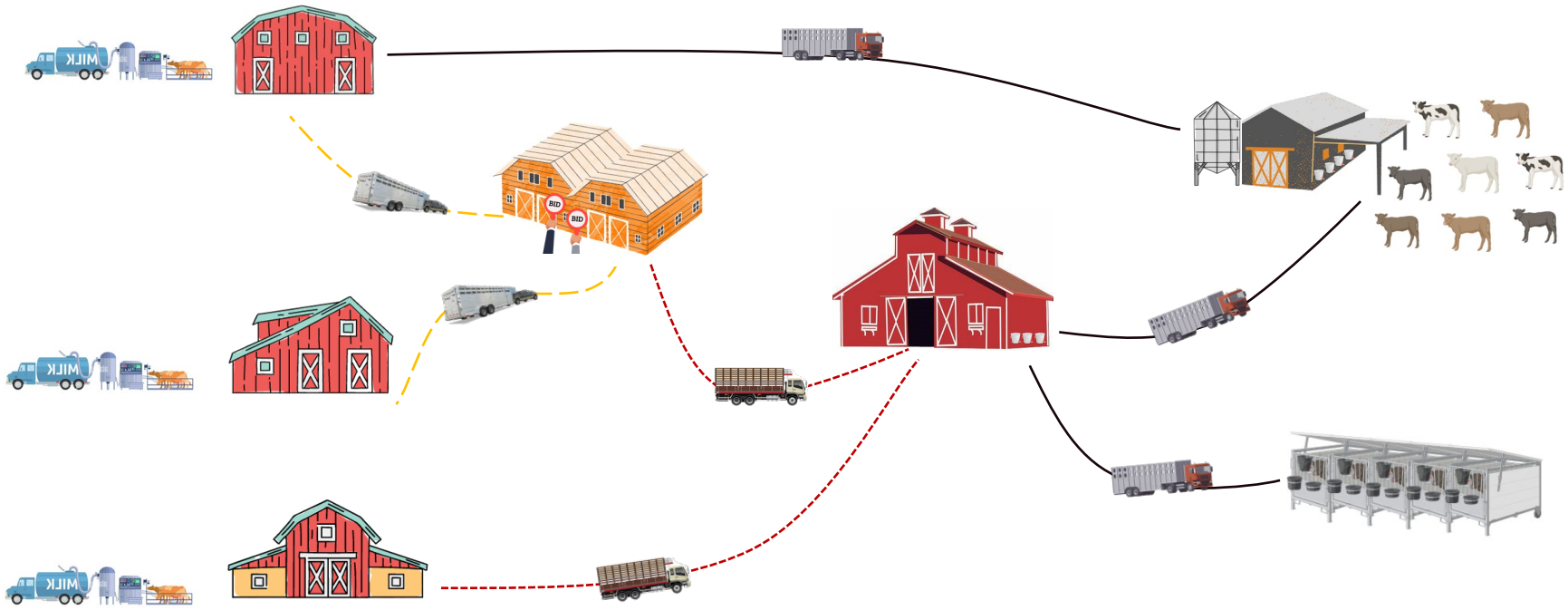
COMMERCIALITZATION OF UNWEANED CALVES :
FROM ORIGIN FARM TO THE REARING FARM



Dairy farm

Auction Market

Assembly Center

Rearing farm

COMMERCIALITZATION OF UNWEANED CALVES :
FACTORS AND EFFECTS

Low intake of colostrum
Delayed colostrum intake
Low quality colostrum
Low milk replacer intake
Restriction of water access
Lack of solid intake
Lack of vaccinations

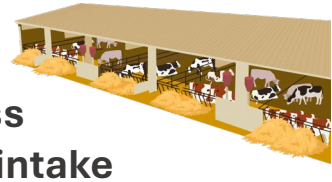
+

Mixing origins
Restriction of milk replacer
Lack of solid feed
Low hygiene measures

+

Mixing origins
Fasting
Transport conditions
Environmental conditions

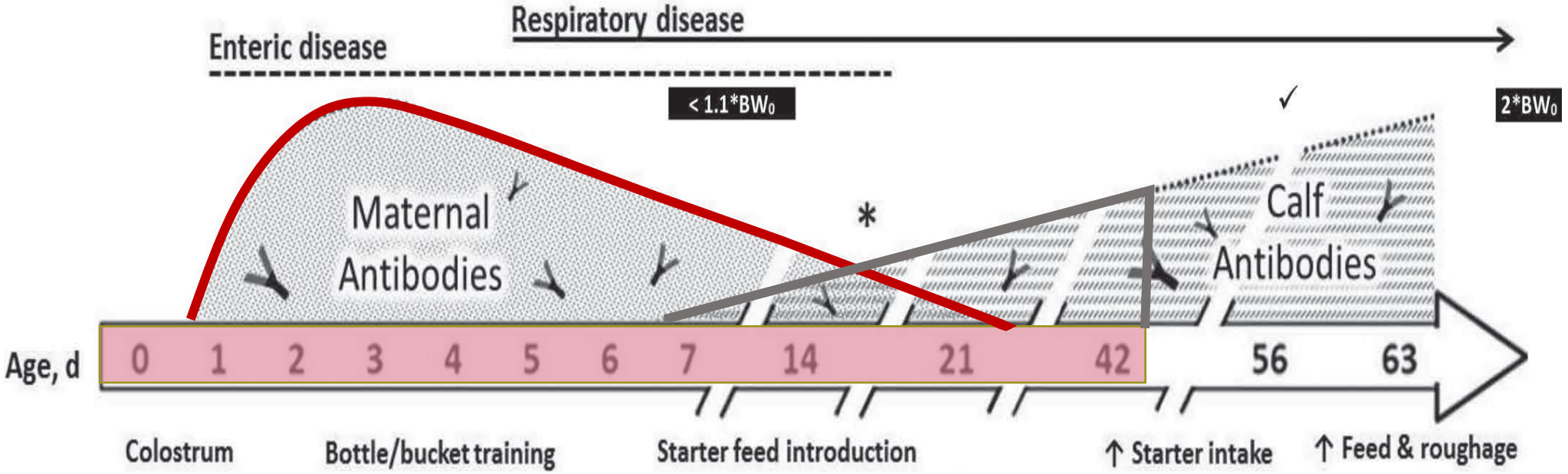
=



Stress
Reduced intake
Impair immune function
Impair gut functionality
Inflammation
Changes in physiology
Muscular damage
Changes in behavior
Morbidity
Antimicrobial use
Mortality

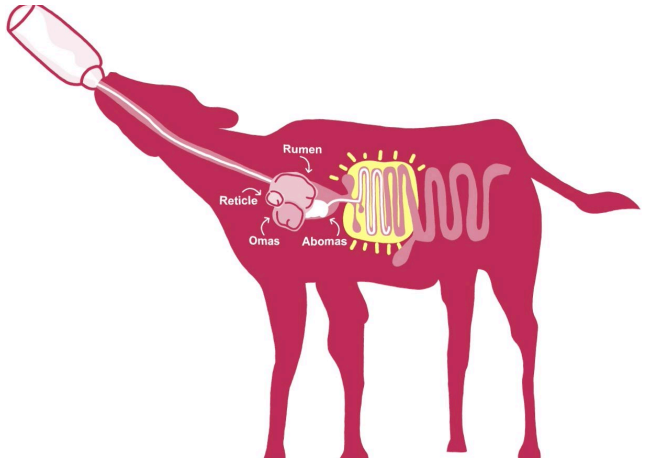
Abdallah et al., 2024; Bajus et al., 2024; Cheng et al., 2024; Goetz and Renaud, 2024; Marcato et al., 2020; Maggard et al., 2024; Marcato et al., 2022; Pisoni et al., 2022; Pisoni et al., 2023a; Pisoni et al., 2023b; Renaud et al. 2020; Wilson et al. 2020.

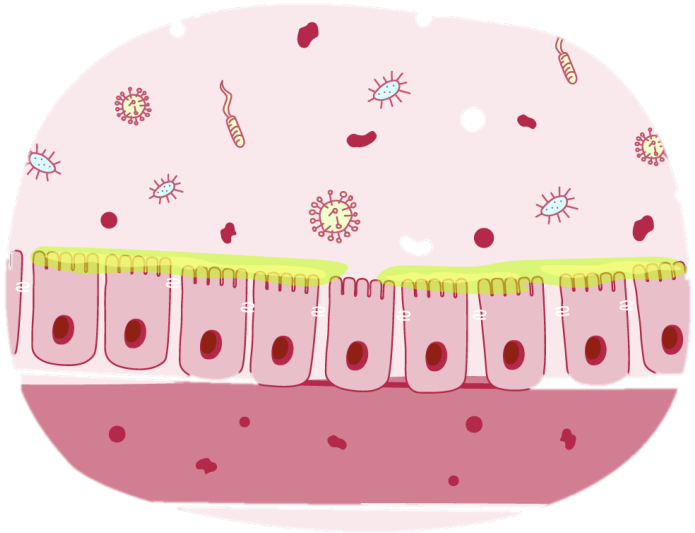
COMMERCIALITZATION OF UNWEANED CALVES :
CRITICAL FOR RECOVERY

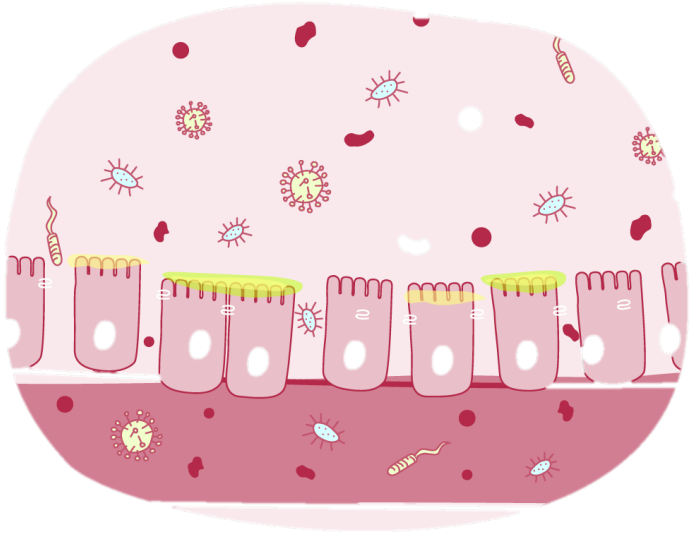


Hulbert and Moisá, 2016

COMMERCIALITZATION OF UNWEANED CALVES :
CRITICAL FOR RECOVERY







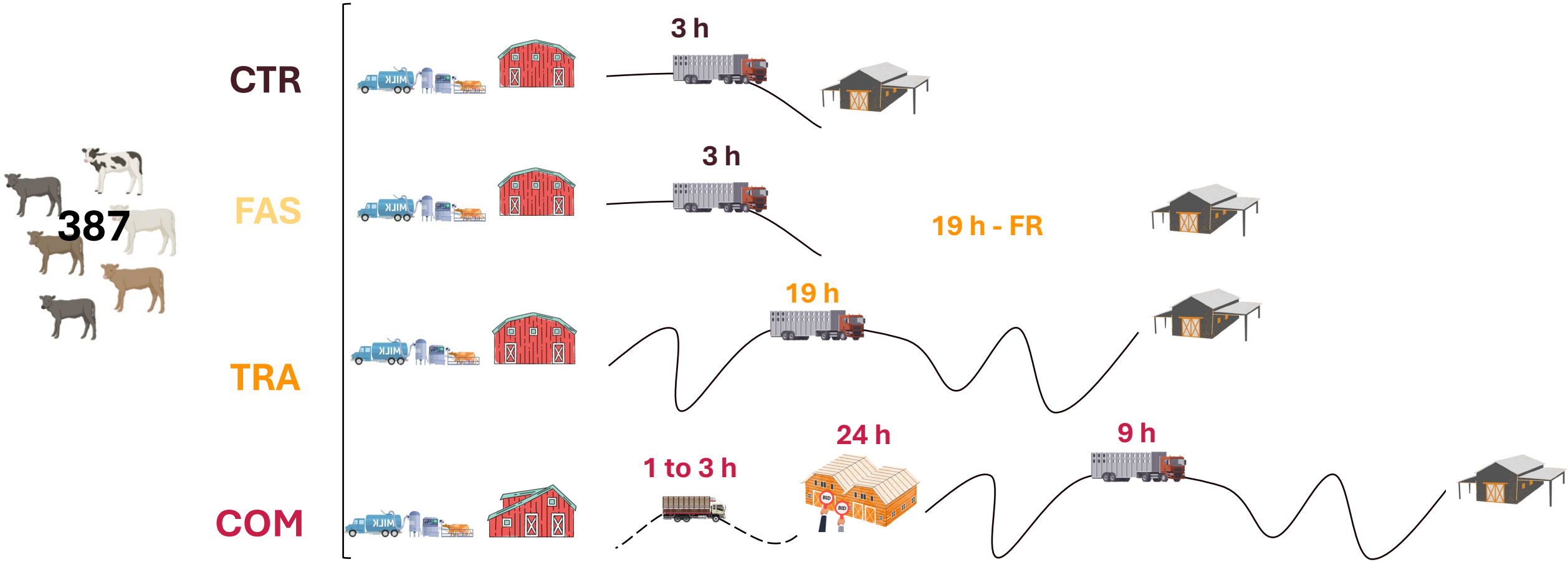
COMMERCIALITZATION OF UNWEANED CALVES :

OBJECTIVE

The aim of this study was to evaluate the impact of transport or overall commercialization (marketing and transport) on intake recovery and growth at farm arrival.

Also evaluate biomarkers of energy balance and gastrointestinal tract functionality.

COMMERCIALITZATION OF UNWEANED CALVES :
MATERIAL AND METHODS



COMMERCIALITZATION OF UNWEANED CALVES :
MATERIAL AND METHODS

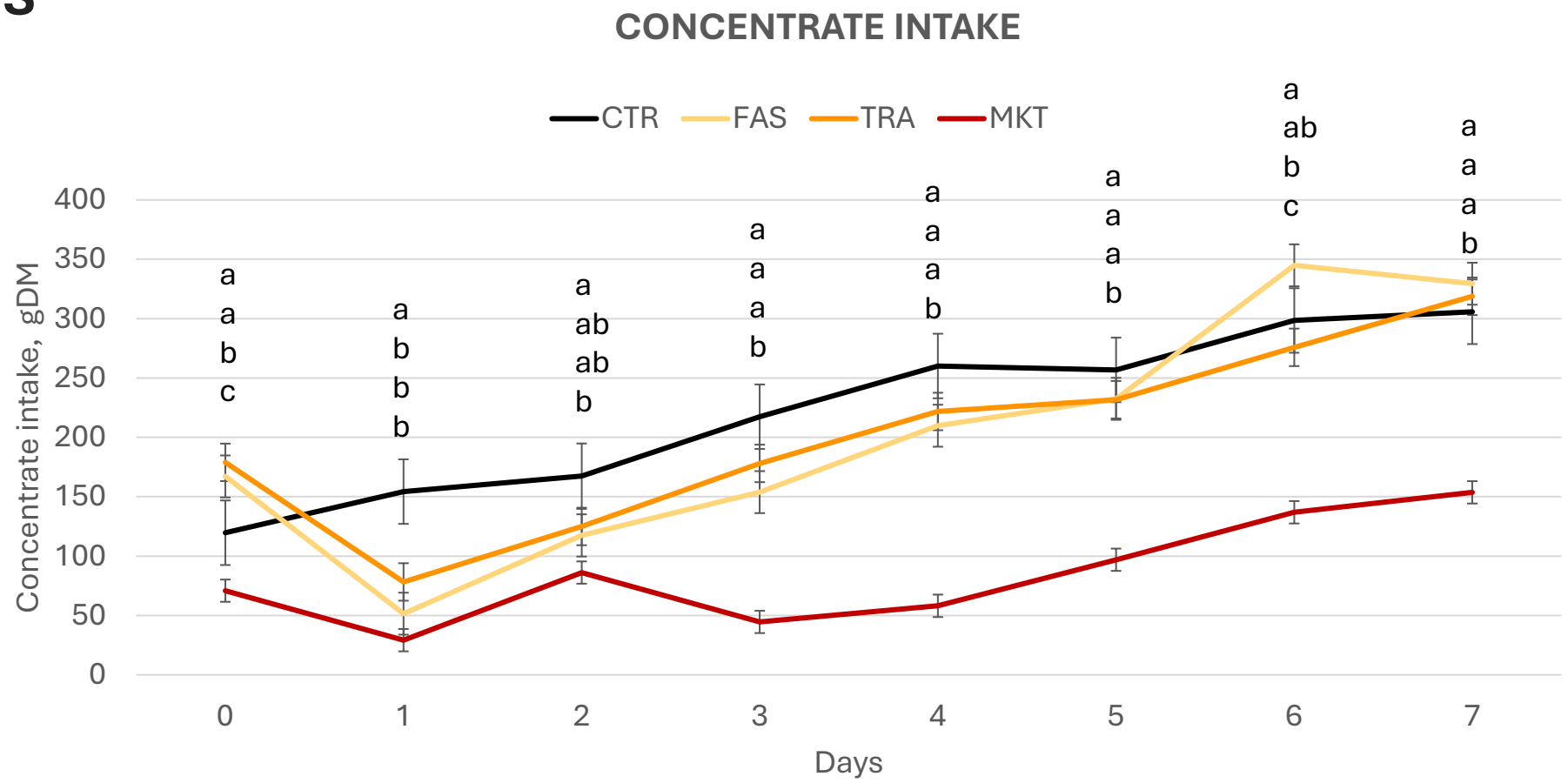
COMMERCIALITZATION OF UNWEANED CALVES :
MATERIAL AND METHODS

- Concentrate intake, milk refusals, and straw intake were recorded daily
- Body weight was recorded on arrival, 24 h, 48 h, and 7 days after arrival
- Blood samples were collected on arrival, 24 h, 48 h, and 7 days after arrival for
  - Markers of energy balance: NEFA, BHB and glucose concentration
  - Markers of gastrointestinal functionality:
    - Intestinal Permeability: Test with Cr-EDTA
    - Enterocyte Mass: Citrulline concentration

- Body weight, concentrate intake, and BHB, NEFA, glucose, Cr-EDTA and citrulline concentration were analyzed with mixed models with repeated measures with commercialization type, time and its interaction as fixed effects and BW at arrival as covariate. Average daily gain was analyzed as described above without repeated measures. Study and pen were considered random effects.

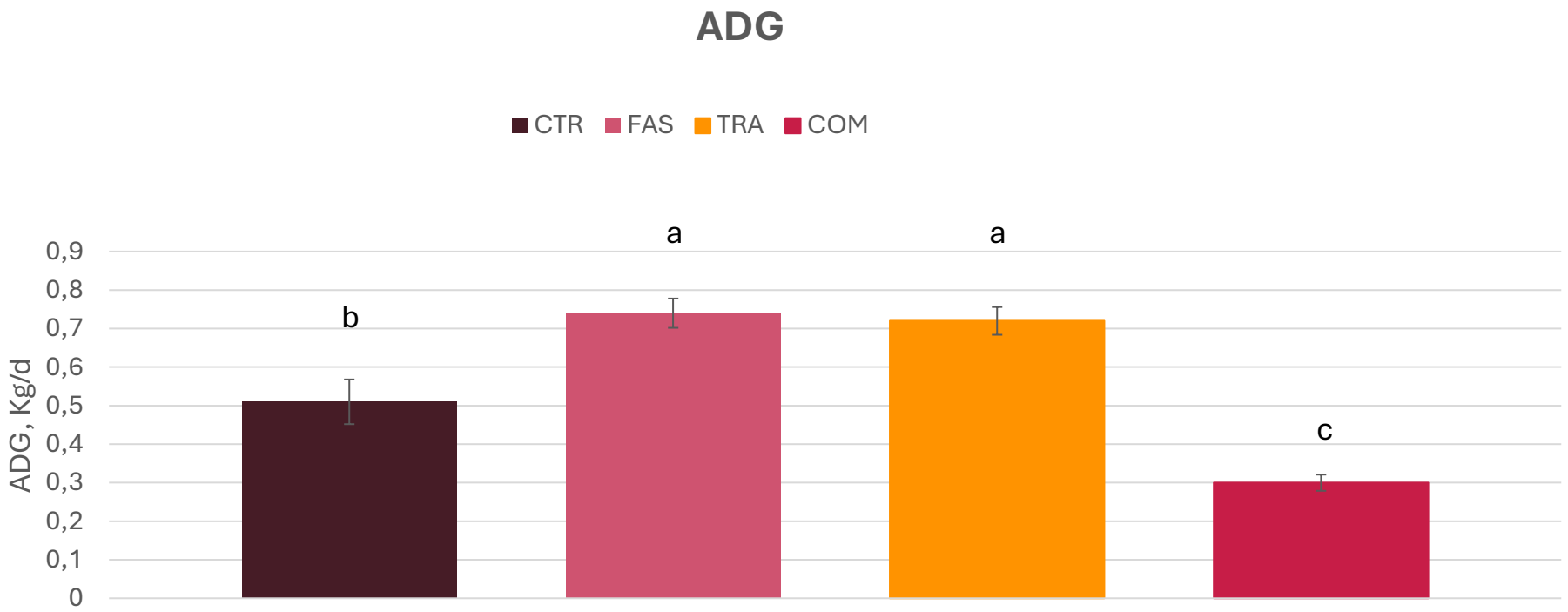

COMMERCIALITZATION OF UNWEANED CALVES :

RESULTS

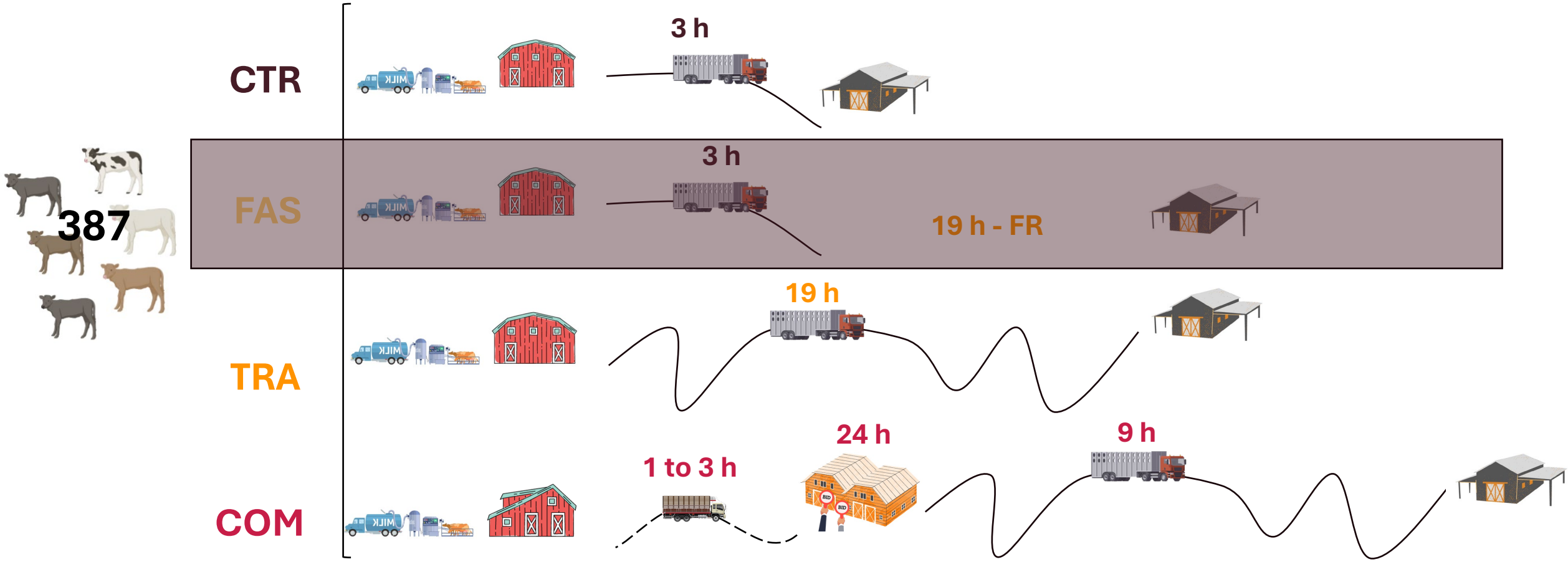


COMMERCIALITZATION OF UNWEANED CALVES :

RESULTS

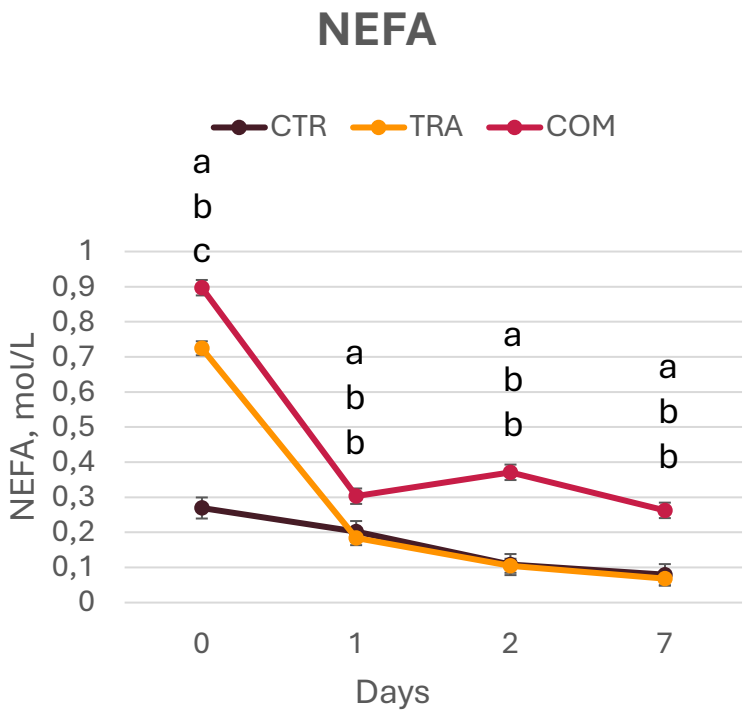


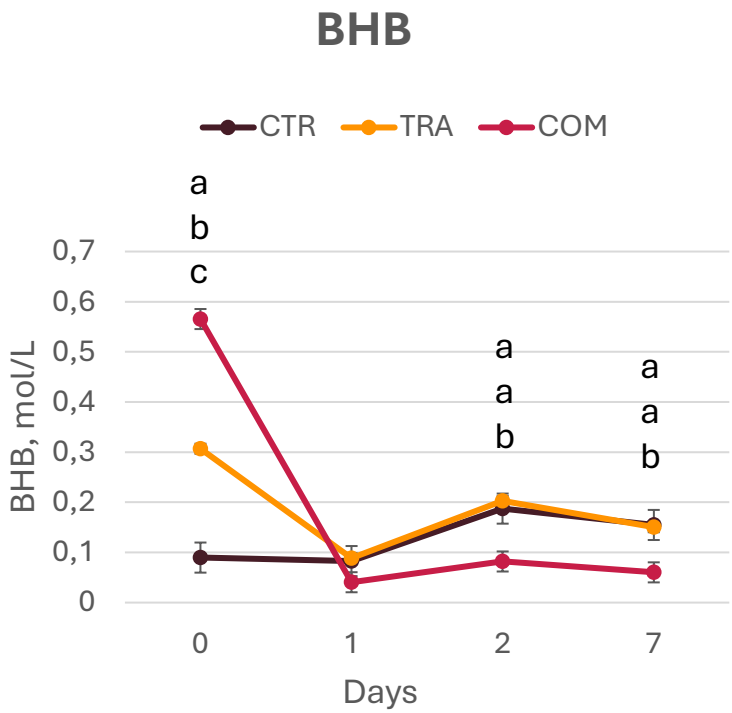
COMMERCIALITZATION OF UNWEANED CALVES :
MATERIAL AND METHODS



COMMERCIALITZATION OF UNWEANED CALVES :

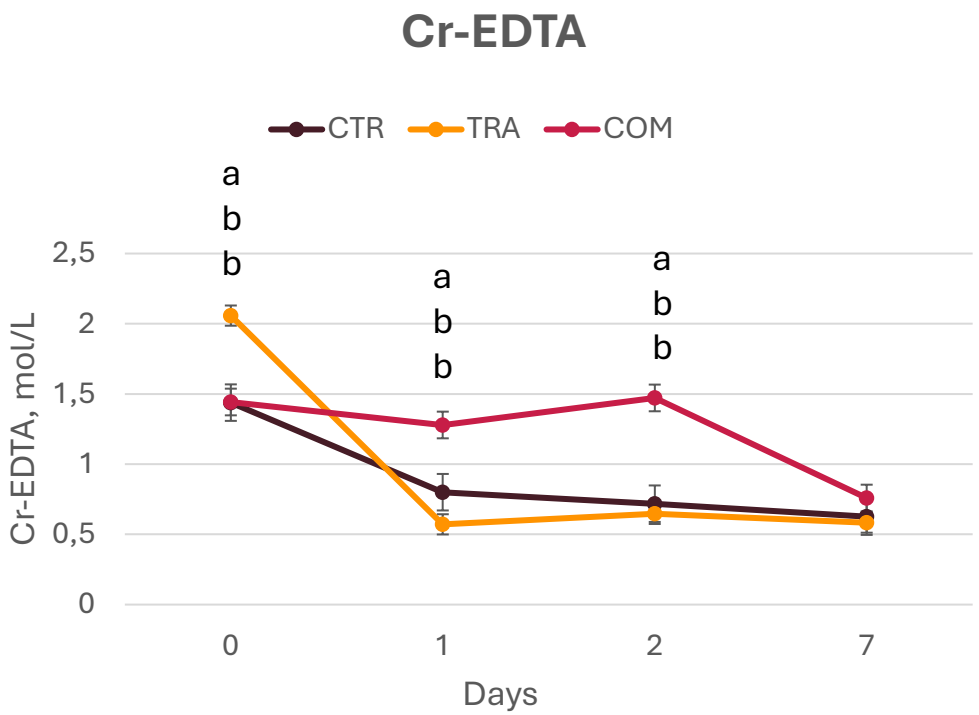
RESULTS

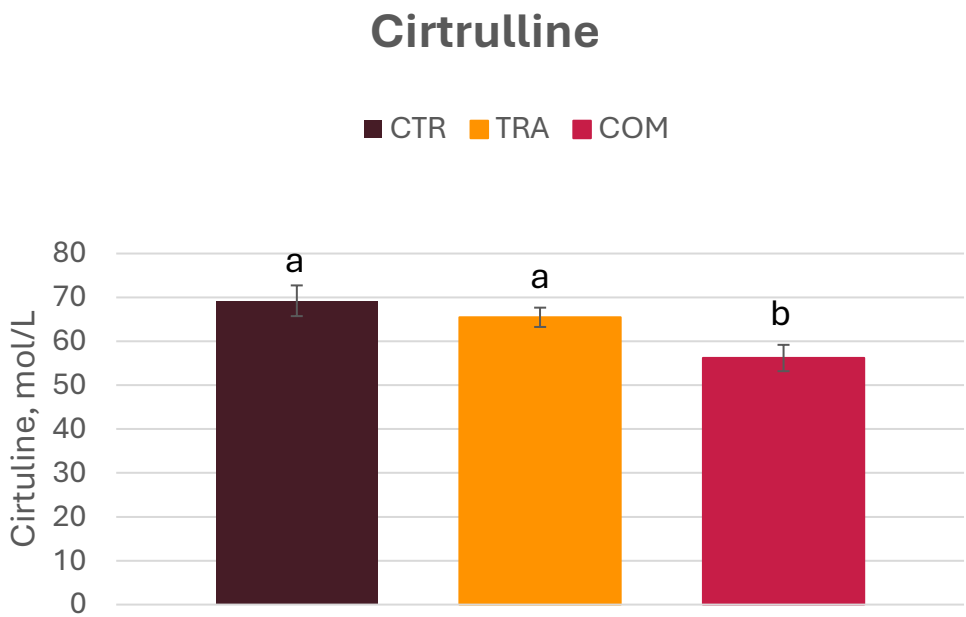




COMMERCIALITZATION OF UNWEANED CALVES :

RESULTS





COMMERCIALITZATION OF UNWEANED CALVES :
CONCLUSIONS

The entire commercialization process, marketing and transportation, of unweaned dairy beef calves impairs intake recovery and growth, and these results are aligned with negative energy balance and comprised gastrointestinal functionality at farm arrival.

ACKNOWLEDGEMENTS :

IRTA Institute of Agrifood Research and Technology

Lucta

UAB Universitat Autònoma de Barcelona

IRTA CReSA Centre de Recerca en Sanitat Animal

Generalitat de Catalunya
Departament d'Acció Climàtica, Alimentació i Agenda Rural

Fons Europeu Agrícola de Desenvolupament Rural:
Europa inverteix en les zones rurals

GOBIERNO DE ESPAÑA
MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

COMMERCIALITZATION OF UNWEANED CALVES :
RESULTS

- The 19 h transported calves (TRA) had a peak of concentrate intake at arrival but their concentrate intake 24 h after drastically drop probably by consuming high amounts of concentrate when their gastrointestinal tract is compromised by long fasting hours. It produces a slow recovery of concentrate intake during the first week after arrival.
- Calves that were marketed and transported (COM) did not eat concentrate during the first 3 days after arrival, and their concentrate intake was not recovered after a week at the rearing farm due to the damage of the intestinal tract observed by greater concentrations of Cr-EDTA for several days and low levels of enterocyte mass.
- Although marketed and transported calves (COM) arrived at higher weights, their average daily gain during the first week was lower than long distance transported calves (TRA).

COMMERCIALITZATION OF UNWEANED CALVES :
RESULTS

- Fat mobilization during before arrival was greater for the marketed and transported calves (COM) compared with the 19 h transported calves (TRA) even though the long distance transported calves had 10 h more of fasting during transport. This results suggest that the management during the marketing period have a big impact on energy balance.
- Instead, glucose concentration was better indicator of fasting hours.
- Intestinal functionality, especially gastrointestinal permeability, is affected by marketing and transportation. The passage of Cr-EDTA to the bloodstream is greater showing an acute effect when calves are only transported. However, a chronic effect of low gastrointestinal permeability affects calves that was also marketed.