



# The 75<sup>th</sup> EAAP Annual Meeting

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## Effect of suckling method on the response of lambs to social isolation and weaning

**UAB**

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# Introduction

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- **Throughout their productive lives, farm animals endure various stresses, such as social interactions, heat stress, and weaning.**
- **The mother-lamb bond strengthens over time with natural suckling** (Weary et al., 2008).
- **Weaning stress components:**
  - **Emotional response** (end of the mother-lamb bond)
  - **End of suckling** (pleasant activity)
  - **Change of nutrition** (milk is completely replaced by solid food)
  - **Change in the environment** (physical and social)

# Hypothesis & Objectives

Compared to lambs that are naturally suckled (NAT), lambs on artificial suckling (ART) would experience **less stress** during weaning



- 🎯 Evaluate the response of NAT and ART lambs to:
  - Social isolation stress (arena test)
  - Weaning stress at the metabolic level

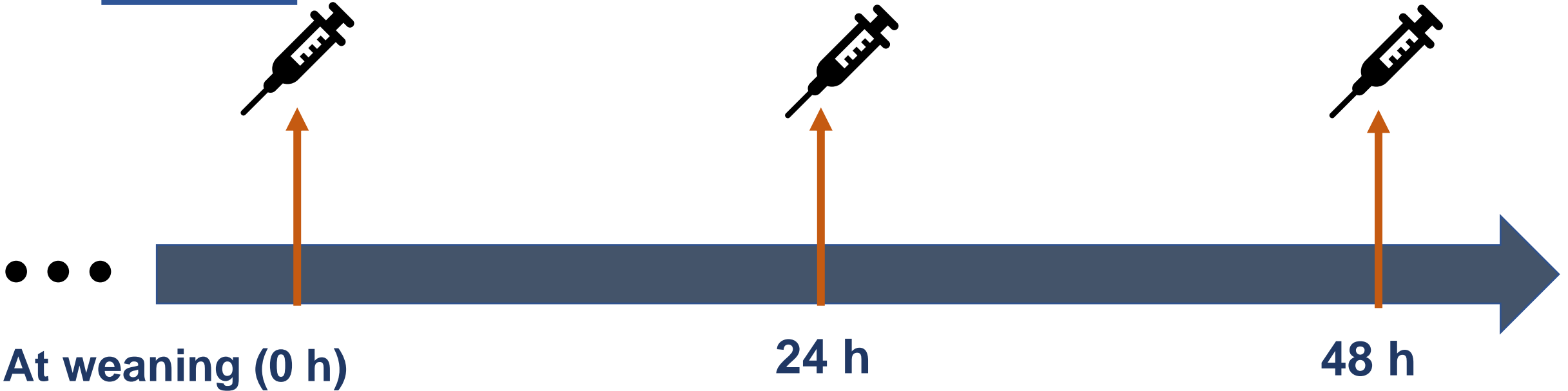
# Materials & Methods

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- **80 Lacaune lambs (34 ♀, 46 ♂):**
  - **Natural (NAT):** n = 41 (20 ♀, 21 ♂) reared by their mothers from birth to weaning
  - **Artificial (ART):** n = 39 (14 ♀, 25 ♂):
    - Separated from their mothers at birth
    - Bottle-fed colostrum of their corresponding mothers (3 times/d during 2 d)
    - Ad libitum milk replacer (Raltec Excell; 200 g/L), according to the manufacturer recommendations
- All lambs (NAT y ART) had free access to concentrate and straw



# Materials & Methods



- ✓ **Cortisol** (ELISA)
- ✓ **Glucose** (hexokinase method)
- ✓ **Free fatty acids** (Enzymatic, colorimetric method)

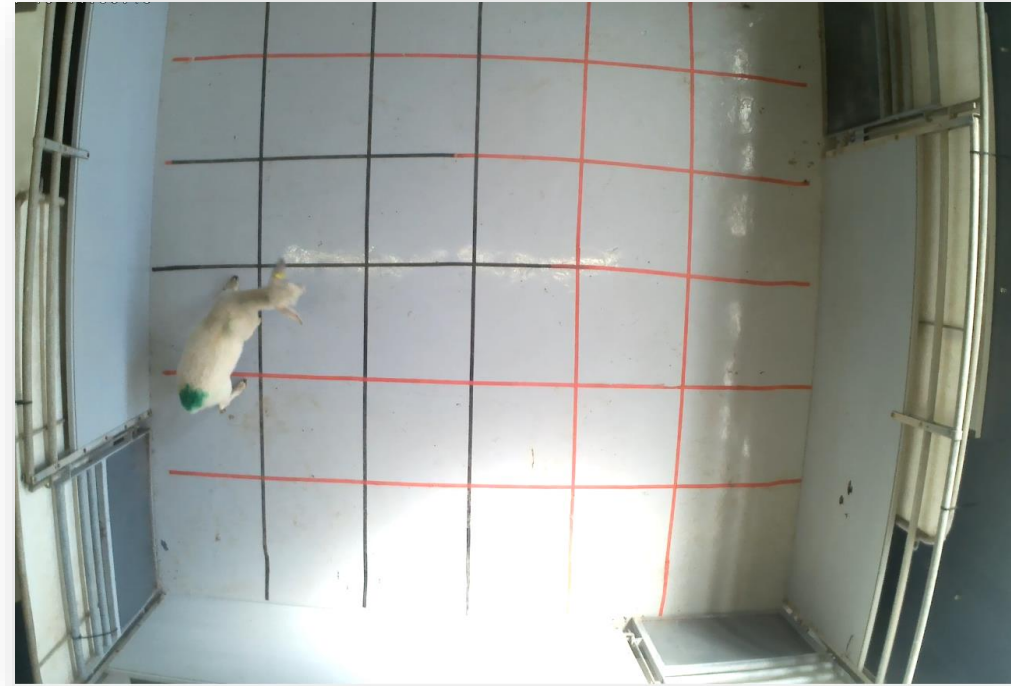
- ✓ **Lactate dehydrogenase** (ECS2 method)
- ✓ **Creatine kinase** (IFCC method)
- ✓ **Haptoglobin** (Hemoglobin fixation method)

# Materials & Methods

- 20 **female** lambs (10 NAT, 10 ART) at the weaning day
- 8 min in the arena

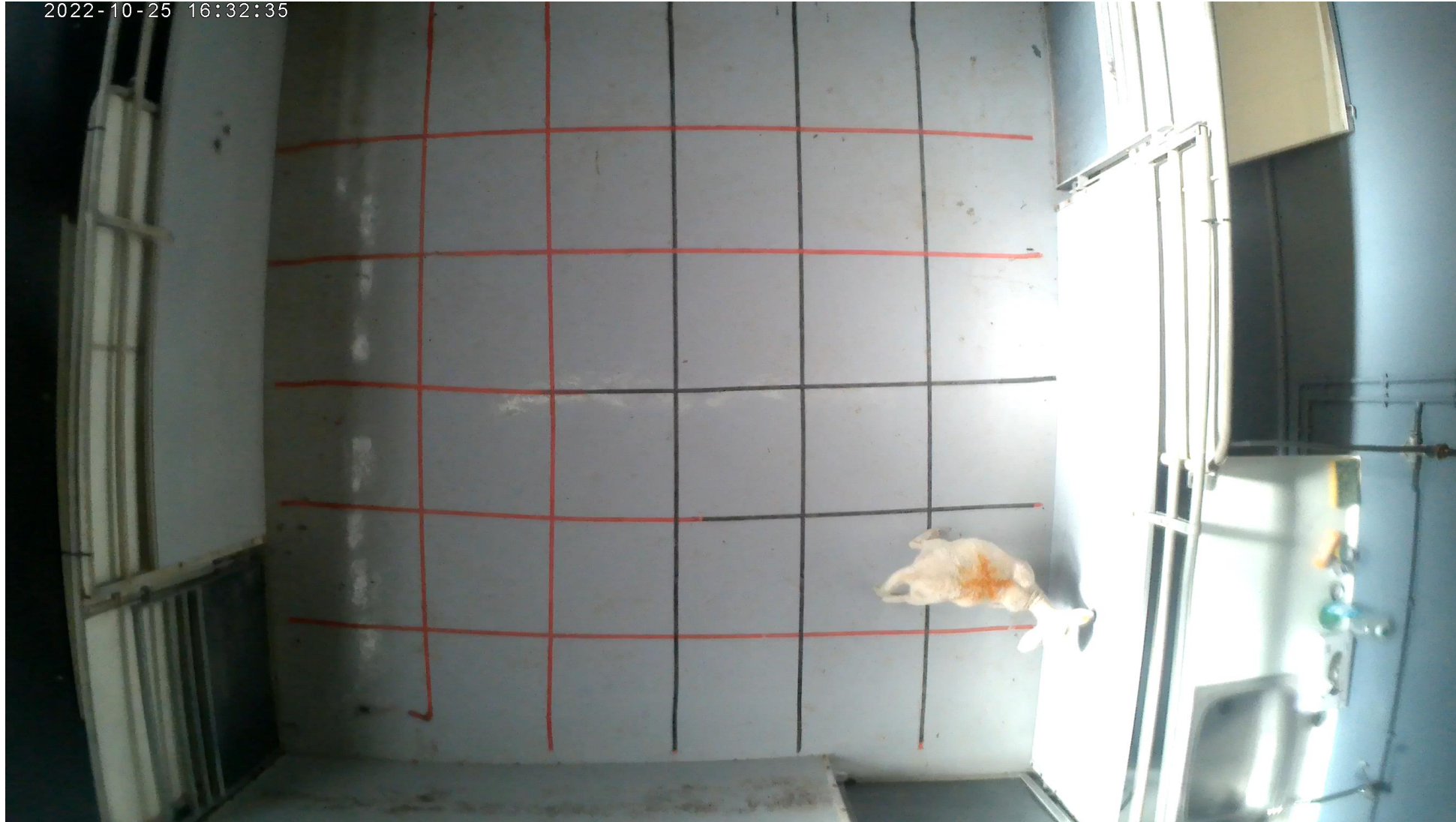
- Measurements

- Time elapsed until the first movement
- Number of squares entered
- number of vocalizations
- Frequency of sniffing
- Frequency of defecation and urination
- Frequency of climbing walls
- Frequency of jumping








# Materials & Methods

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# Materials & Methods



-  Data transformation for non-normally distributed data by Minitab
-  PROC MIXED for repeated measurements (SAS Inst. v.9.4)
-  Fixed effects: treatment, sex, litter size, time
-  Random effects: animal and residual
-  Data with unequal variances were analyzed using the Wilcoxon test in SAS

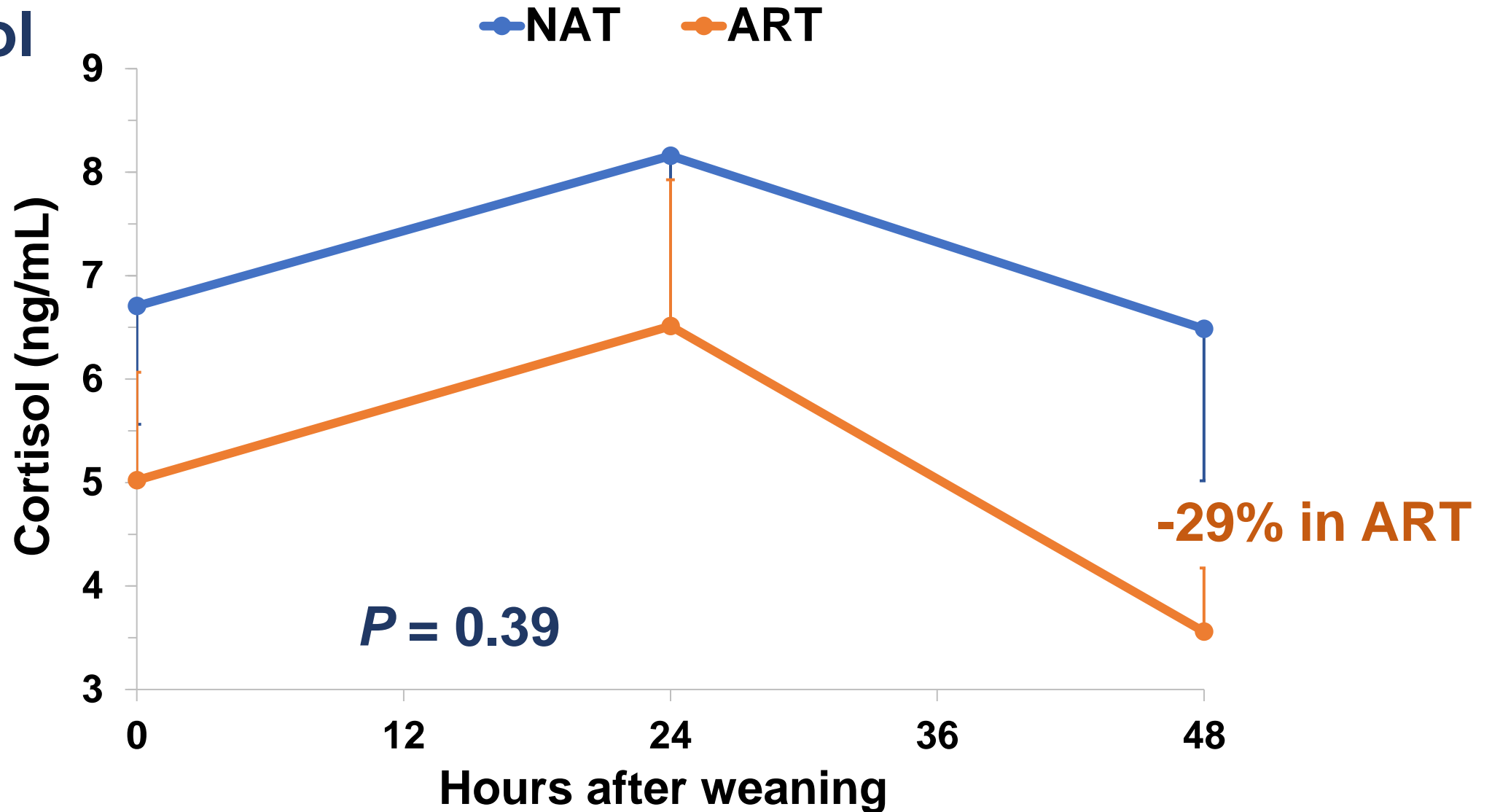


# Results: Response to the arena test

Item	Treatment		<i>P</i>
	NAT	ART	
<b>Latency time, s</b>	29.3 ± 6.2	15.0 ± 7.8	0.08
<b>Squares entered, n</b>	33.0 ± 1.1	30.0 ± 2.4	0.29
<b>Vocalizations, n</b>	48.0 ± 8.7	78.5 ± 15.5	0.06
<b>Sniffs, n</b>	39.2 ± 5.8	18.6 ± 3.6	0.02
<b>Wall climbing, n</b>	7.5 ± 2.2	17.0 ± 2.7	0.03
<b>Wall jumps, n</b>	13.0 ± 3.5	14.0 ± 3.6	0.96

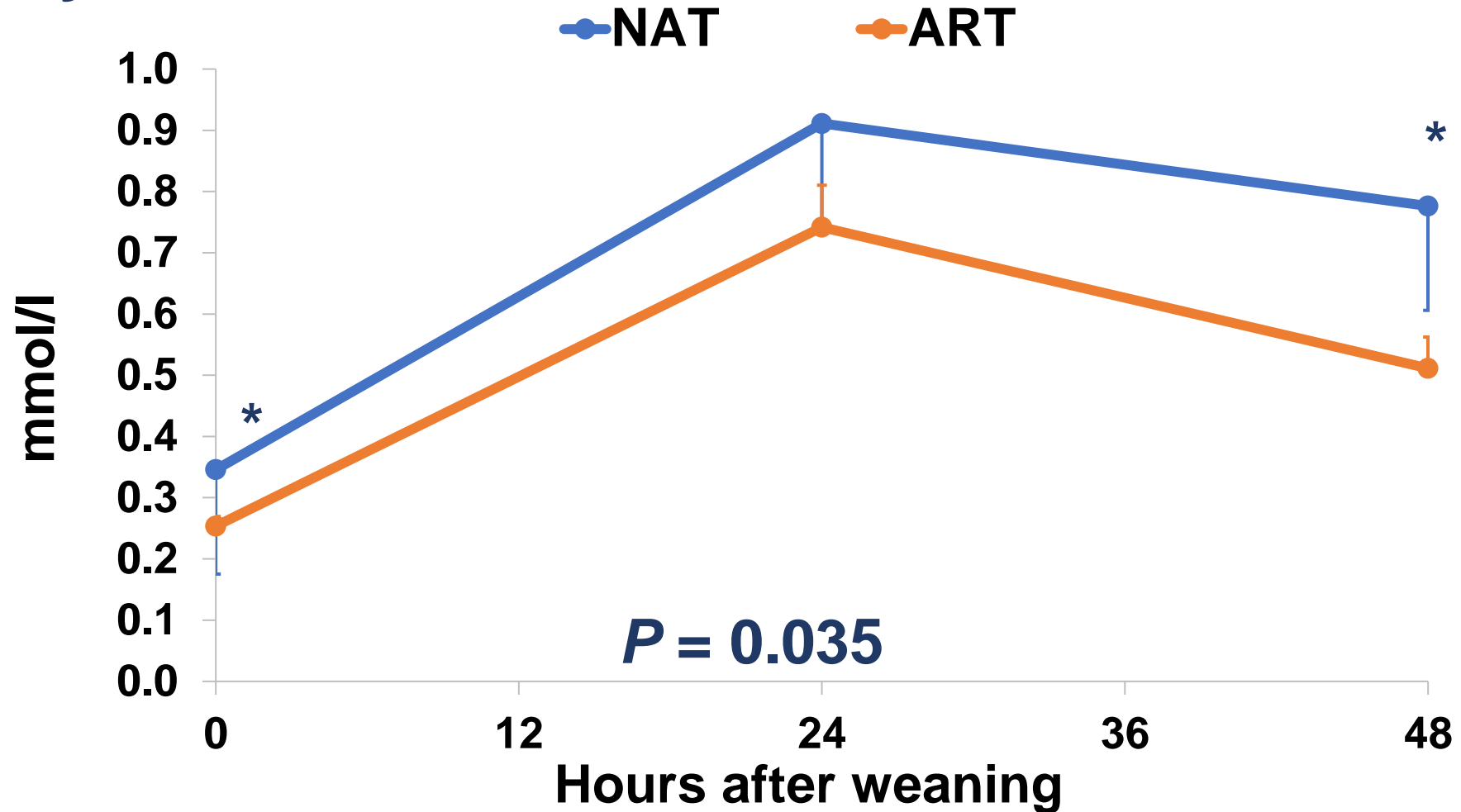
# Results: Metabolic response to weaning

## Cortisol



# Results: Metabolic response to weaning

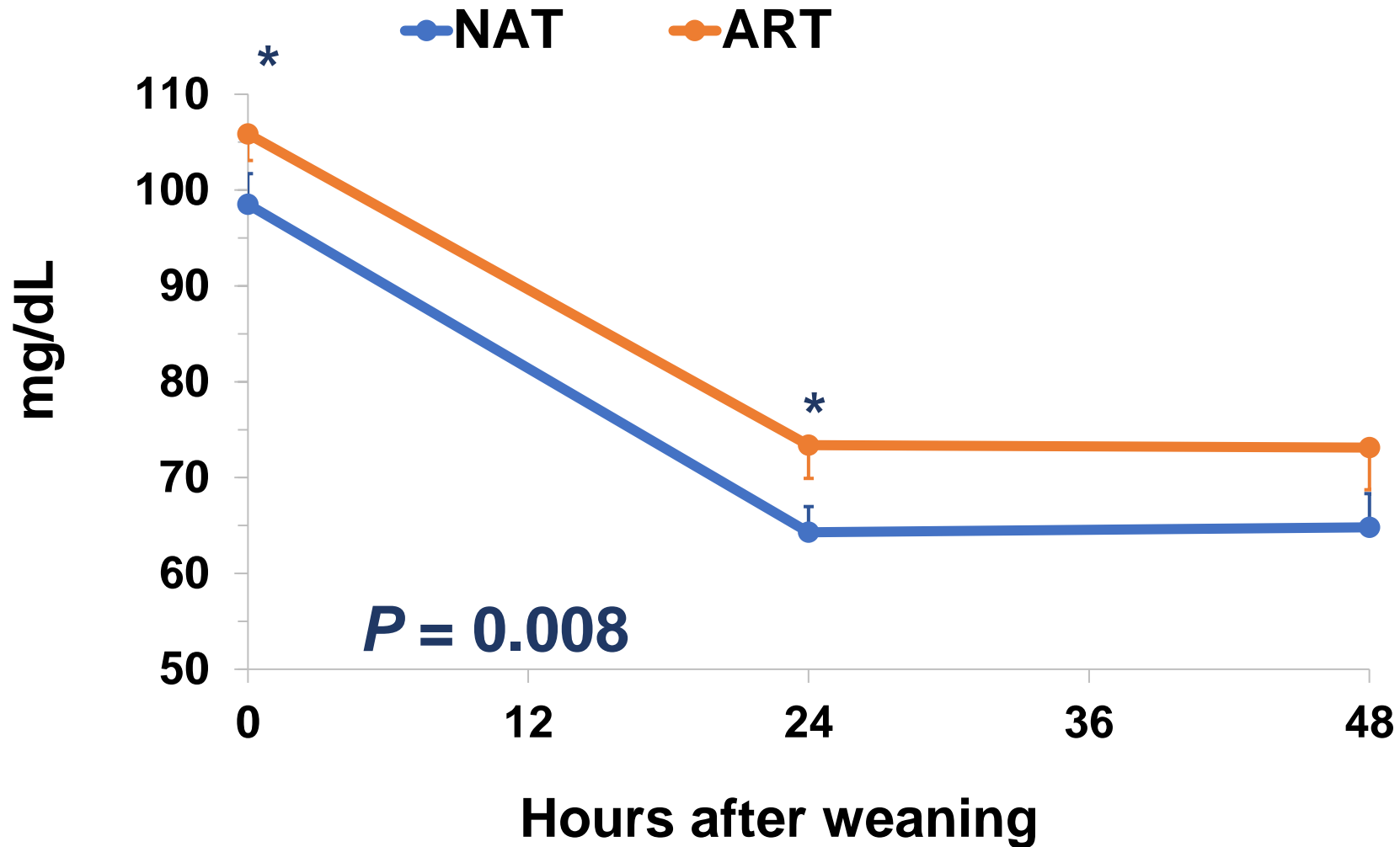
## Free fatty acids



\*Significant difference ( $P < 0.05$ ) at each time point

# Results: Metabolic response to weaning

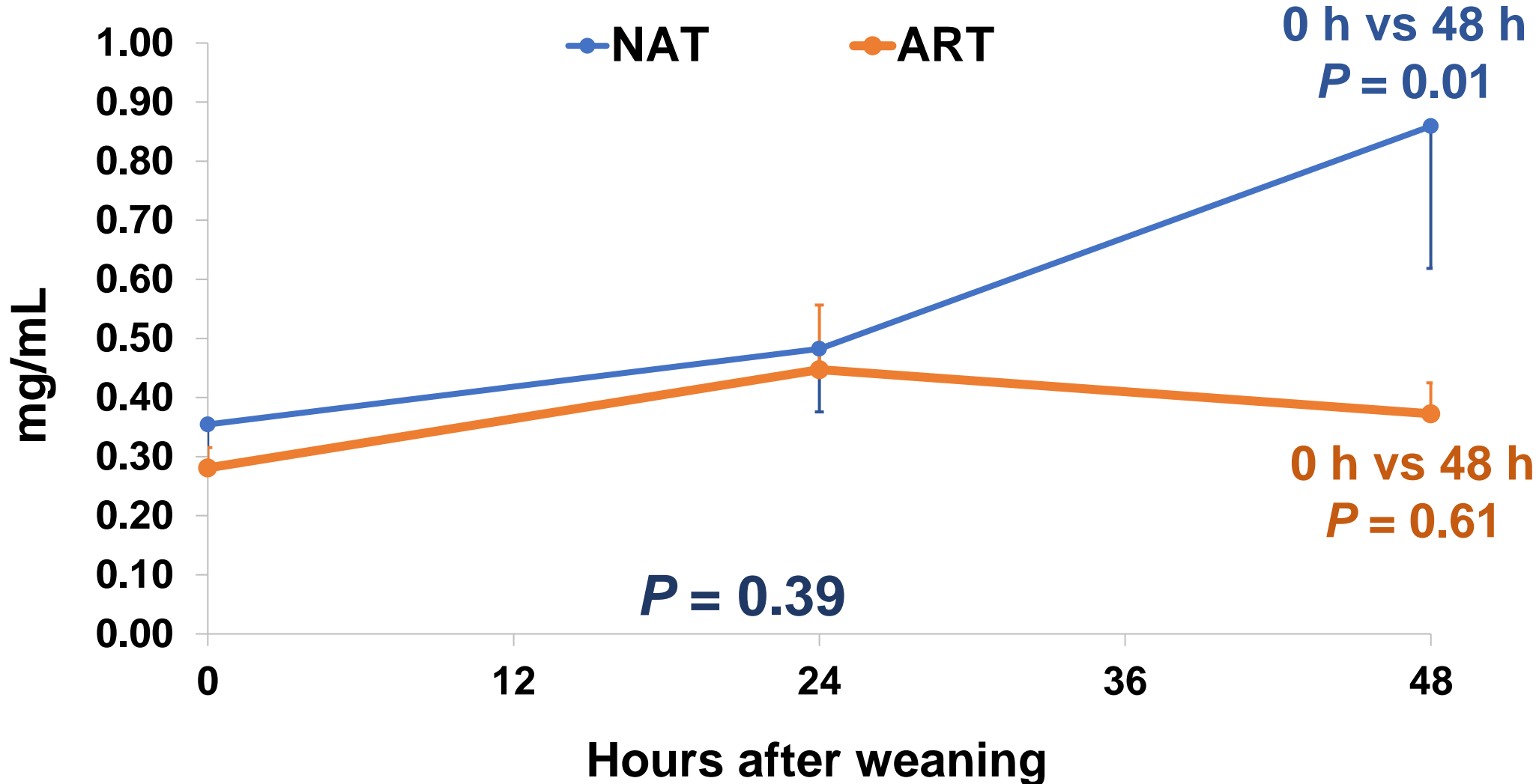
## Glucose



\*Significant difference ( $P < 0.05$ ) at each time point

# Results: Metabolic response to weaning

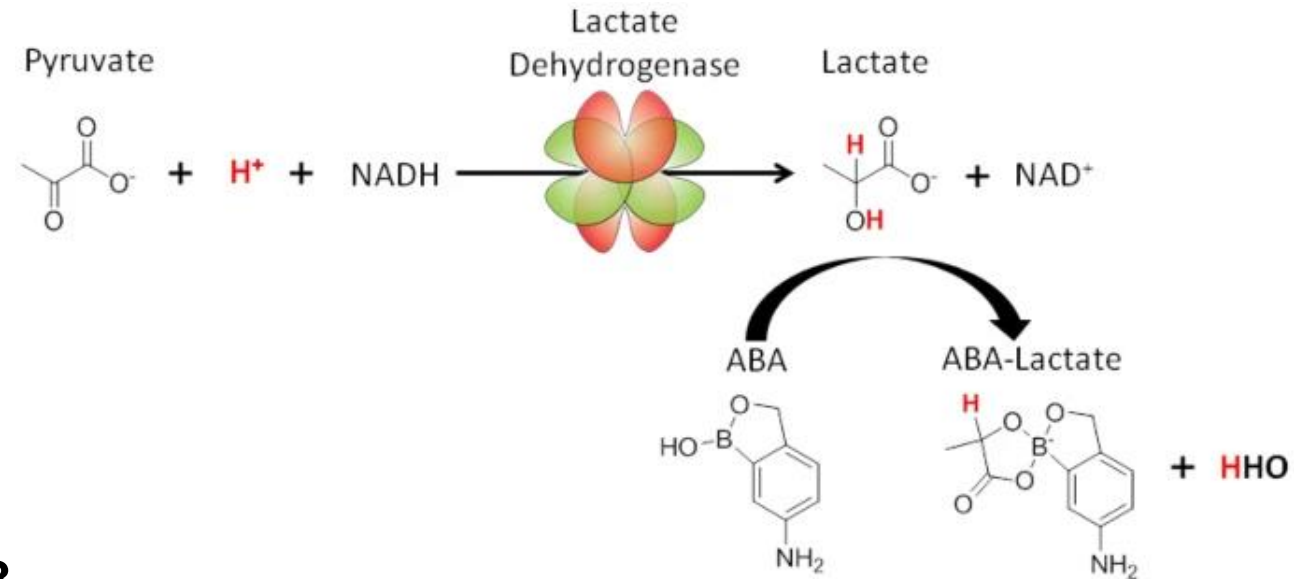
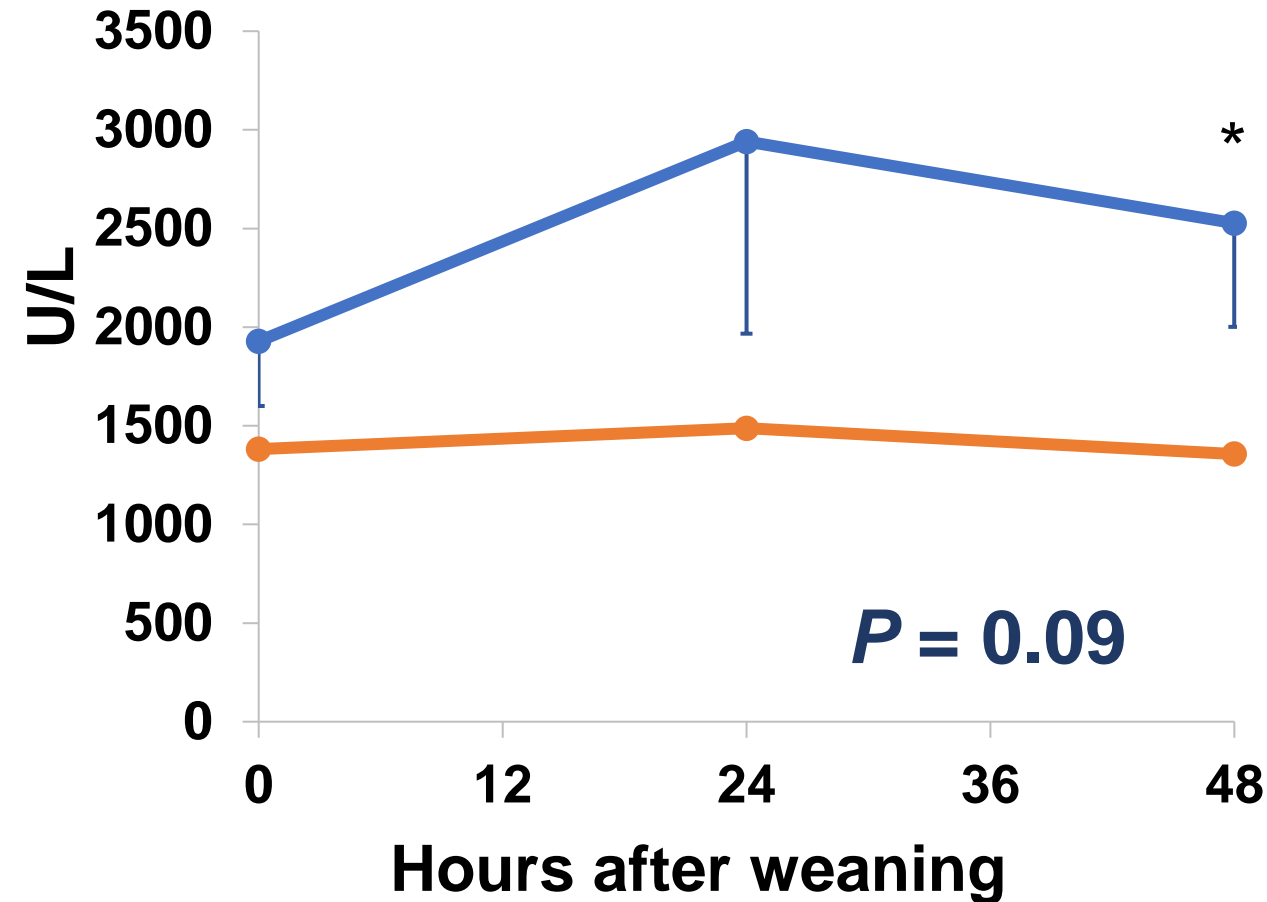
## Haptoglobin



# Results: Metabolic response to weaning

## Lactate dehydrogenase

● NAT ● ART

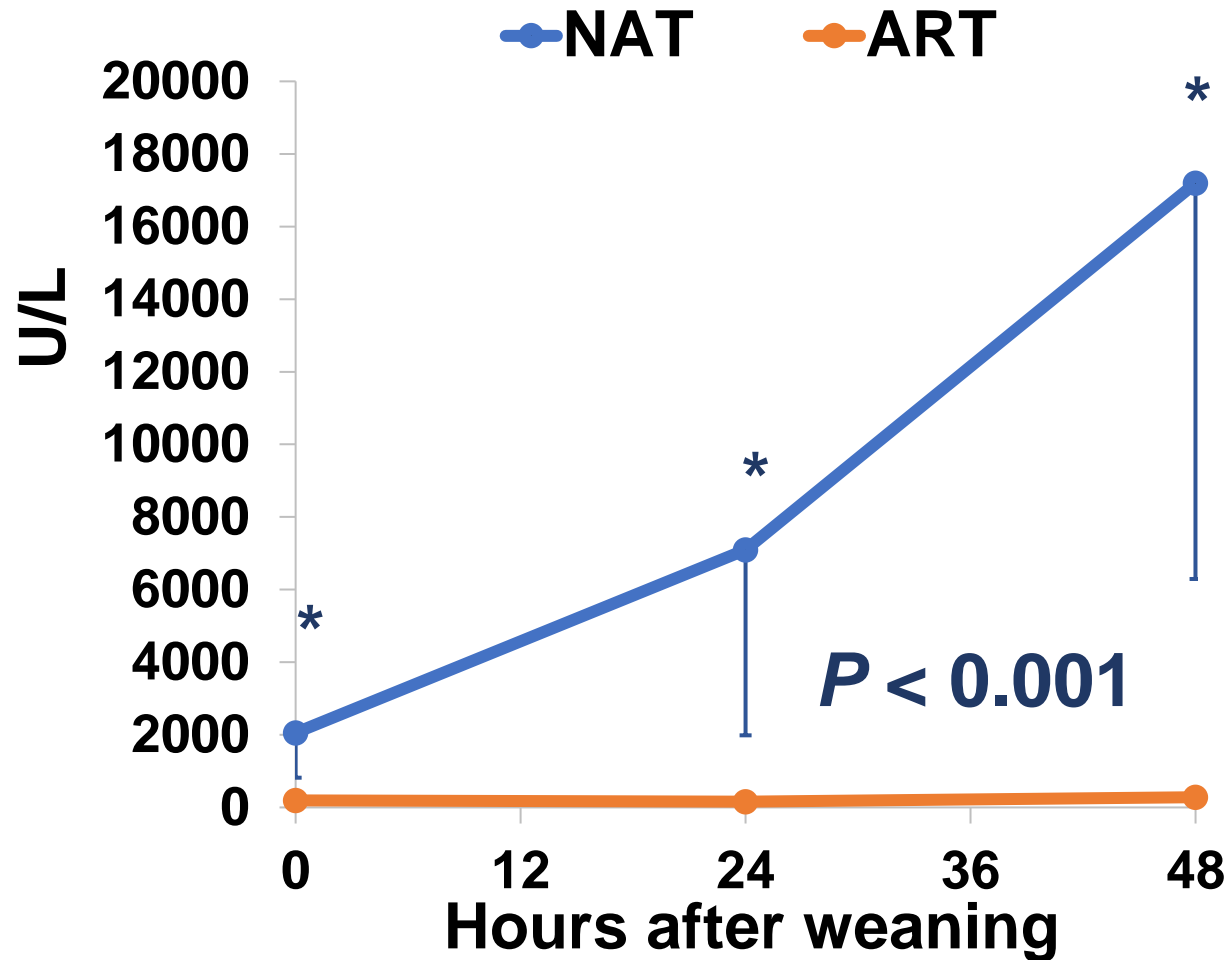


<https://www.nature.com/articles/srep05189>

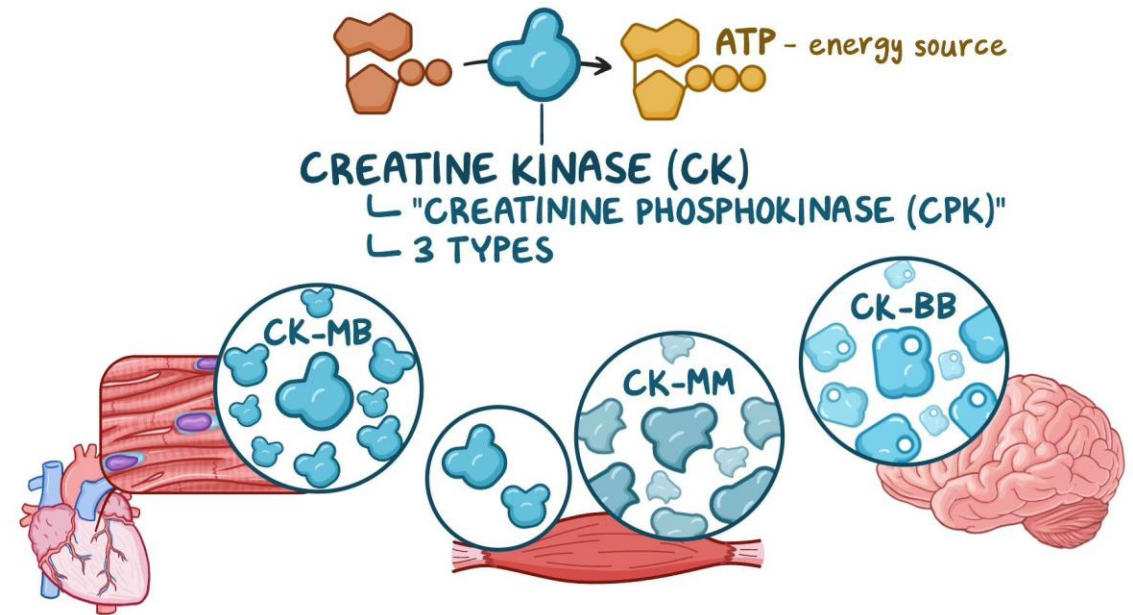
\* Significant difference ( $P < 0.05$ ) at each time point

# Results: Metabolic response to weaning

## Creatine kinase



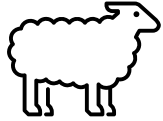
\*Significant difference ( $P < 0.05$ ) at each time point



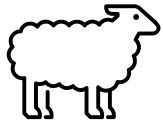
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# Conclusions

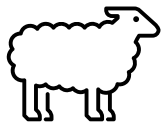
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**The ART lambs exhibited bolder and more active behavior, while the NAT lambs demonstrated more cautious behavior**



**The ART lambs suffered less stress at weaning compared to NAT lambs.**



**The response of ART lambs to stress throughout their productive lambs should be evaluated.**



**Thank you for your  
attention!**



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