



UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI MEDICINA VETERINARIA
E SCIENZE ANIMALI

Camelina sativa and Cynara cardunculus cakes supplementation on performance and milk composition in dairy goats during the transition period

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Introduction



Cardoon seeds



Camelina seeds



Cardoon and
camelina oil



Presscake (by-product)



Introduction



Cardoon seeds

PUFAs
21,28% protein (essential aa)
51,32% NDF
Polyphenols
Omega-6



Camelina seeds

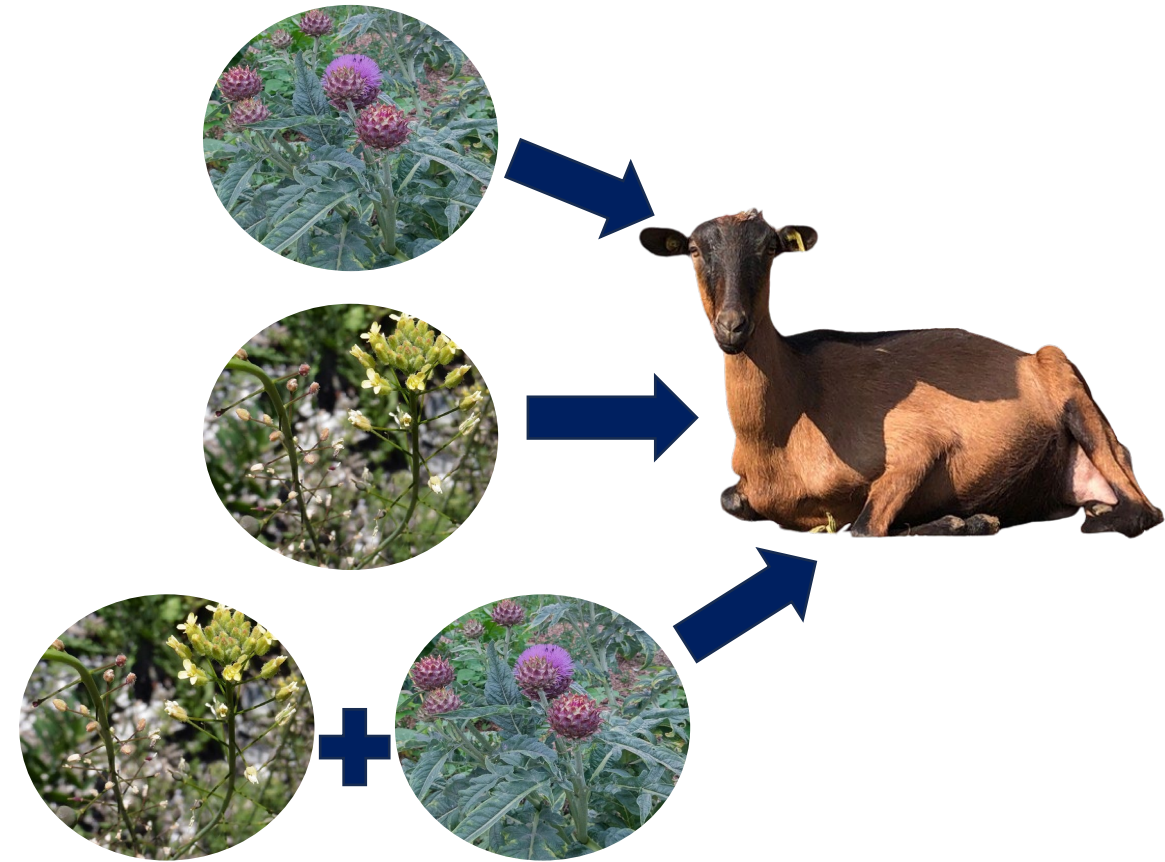
Omega 3- omega 6
linoleic and α -linoleic acid
33.54% protein
Polyphenols
Tocopherols



Objective



Evaluate the effects of camelina, cardoon and a mixture of camelina and cardoon cakes implementation on performances, blood metabolites, oxidant status and colostrum quality in transitioning dairy goats

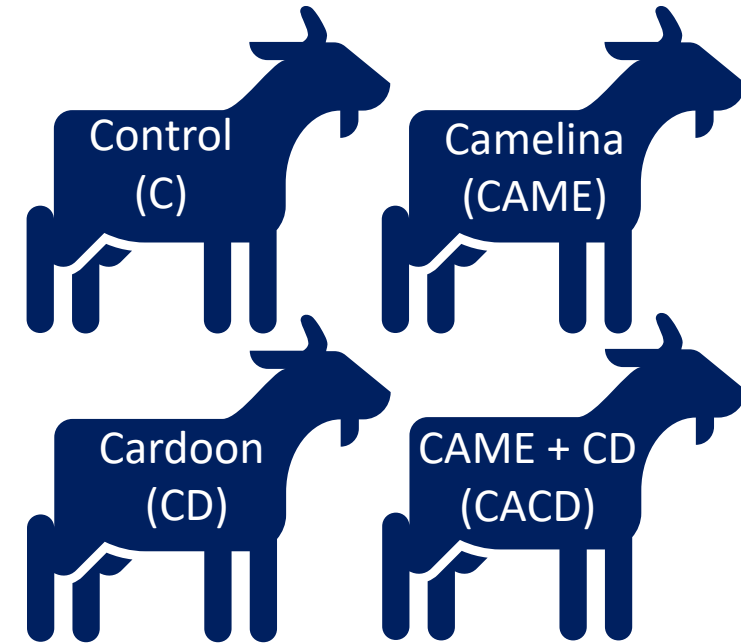


Materials and methods



Thirty-six transitioning Alpine dairy goats (age: 3.04 ± 0.85 years; average daily milk production: 3.93 ± 1.23 L)

Grouped in 4 experimental groups (n=9) and randomly assigned to 4 **isoenergetic** and **isonitrogenous** diets:



Materials and methods

DIET COMPOSITION AND FEED ANALISYS



DIET DURING DRY-OFF

Ingredients %	C	CAME	CD	CACD
Mixed hay	76.83	76.83	76.83	76.83
Feedstuff	23.17	17.38	19.27	18.77
Camelina cake	-	5.79	-	2.2
Cardoon cake	-	-	3.90	2.2
Chemical composition				
DM (g/kg)	93.02	93.02	93.02	93.02
CP (%)	10.31	10.31	10.31	10.31
EE (%)	9.89	9.89	9.89	9.89
NDF (%)	53.50	53.50	53.50	53.50
ADF (%)	35.09	35.09	35.09	35.09
Ash (%)	6.00	6.00	6.00	6.00

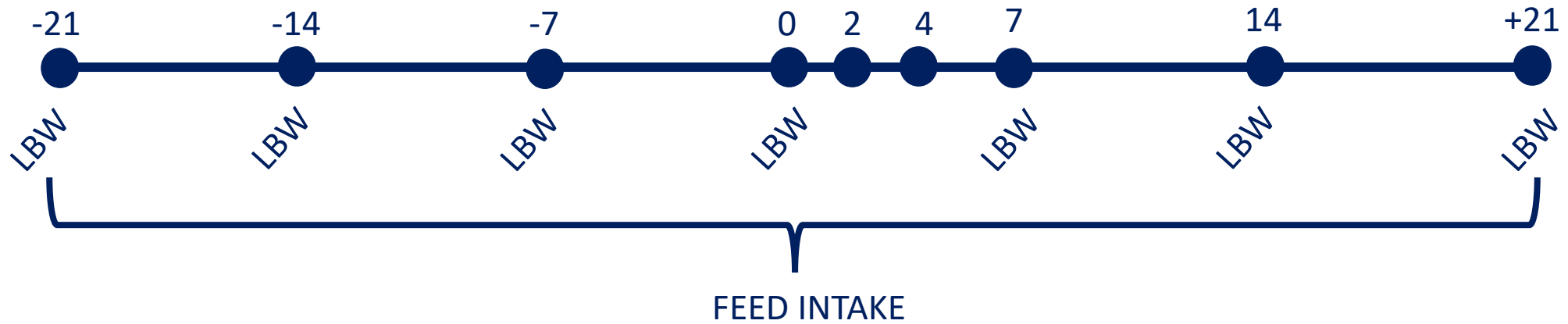
DIET DURING LACTATION

Ingredients %	C	CAME	CD	CACD
Mixed hay	69.76	69.76	69.76	69.76
Feedstuff	30.24	24.19	24.19	24.19
Camelina cake	-	6.05	-	3.025
Cardoon cake	-	-	6.05	3.025
Chemical composition				
DM (g/kg)	92.80	92.80	92.80	92.80
CP (%)	11.46	11.46	11.46	11.46
EE (%)	13.80	13.80	13.80	13.80
NDF (%)	51.45	51.45	51.45	51.45
ADF (%)	32.77	32.77	32.77	32.77
Ash (%)	6.26	6.26	6.26	6.26



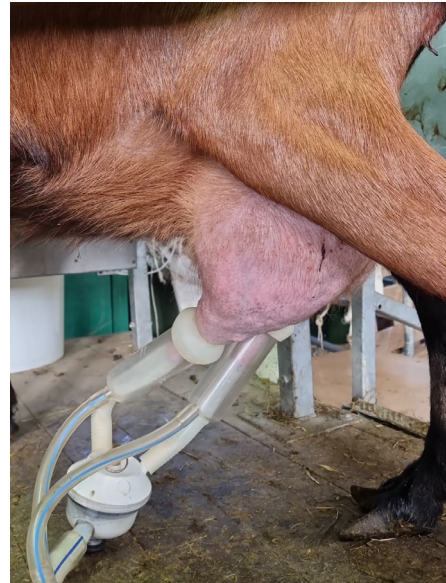
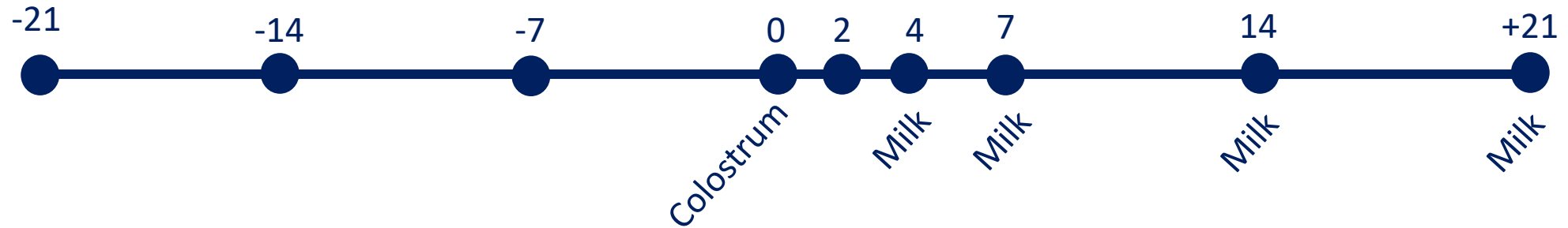
Materials and methods

SAMPLING



Materials and methods

SAMPLING



COLOSTRUM SAMPLES :

- Antioxidant capacity
FRAP assay
- Total phenolic content
Folin-Ciocalteu method

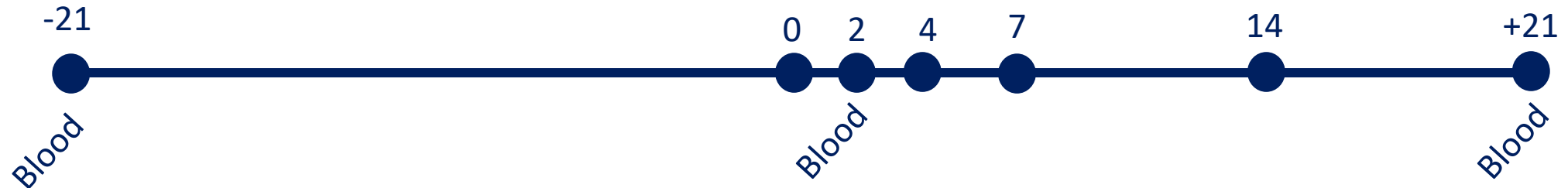
MILK SAMPLES :

- Milk composition
- Fatty acid profile



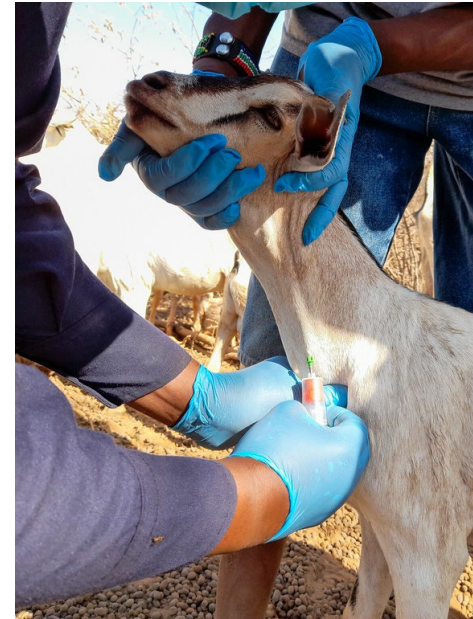
Materials and methods

SAMPLING



BLOOD SAMPLES :

- Serum
- Blood metabolites
 - ROS spectrophotometric d-ROM test
 - SAC OXY-Adsorbent Test
 - OSi ROS/SAC



Results

INTAKE AND PERFORMANCE



	C	CACD	CAME	CD	P value
FI (Kg/day)	2671 ± 170.08	3011.92 ± 192.85	2899.36 ± 180.4	2727.92 ± 180.41	>0.05
DMI (Kg/day)	2418.51 ± 153.2	2724.96 ± 173.71	2623.75 ± 162.5	2466.58 ± 162.51	>0.05
LBW (Kg)	58.69 ± 2.47	60.67 ± 2.80	64.19 ± 2.62	62.86 ± 2.63	>0.05
BCS	2.61 ± 0.07	2.68 ± 0.08	2.69 ± 0.07	2.75 ± 0.07	>0.05

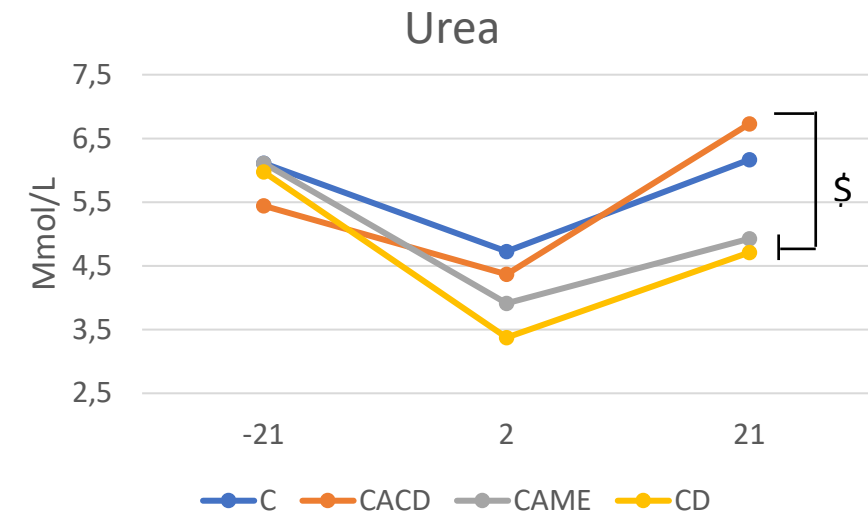


Results

BLOOD METABOLITES



	C	CACD	CAME	CD	p value
Urea mmol/L	5.67 ± 0.32	5.51 ± 0.35	4.98 ± 0.33	4.69 ± 0.33	ns
NEFA mmol/L	0.44 ± 0.03	0.40 ± 0.04	0.47 ± 0.035	0.39 ± 0.35	ns
BHB mmol/L	0.4 ± 0.03	0.38 ± 0.034	0.43 ± 0.032	0.39 ± 0.032	ns
Chol mmol/L	2.3 ± 0.13	2.33 ± 0.15	2.41 ± 0.14	2.32 ± 0.14	ns
Trigly mmol/L	0.21 ± 0.02	0.2 ± 0.02	0.2 ± 0.02	0.22 ± 0.02	ns
Ca mmol/L	2.15 ± 0.04	2.17 ± 0.05	2.17 ± 0.04	2.12 ± 0.04	ns

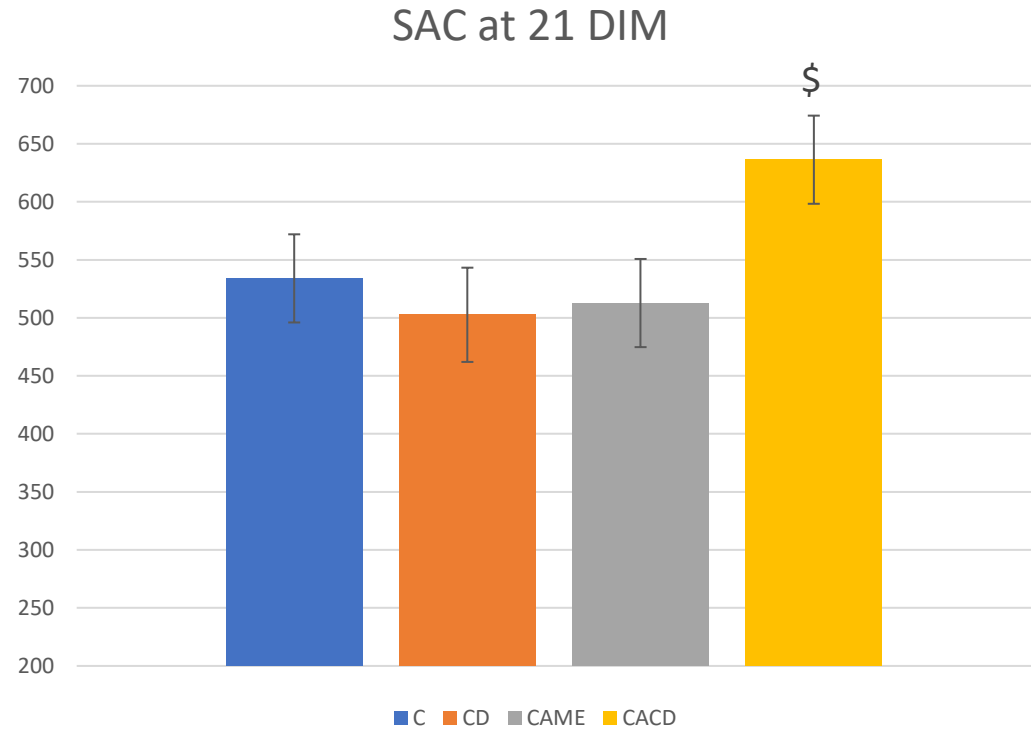


treat*time: 0.1<p<0.05



Results

OXIDANT STATUS- serum

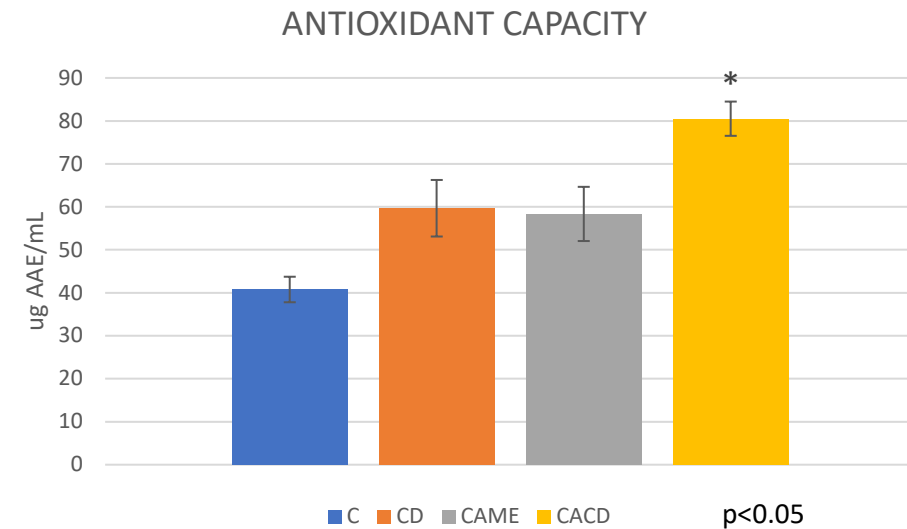
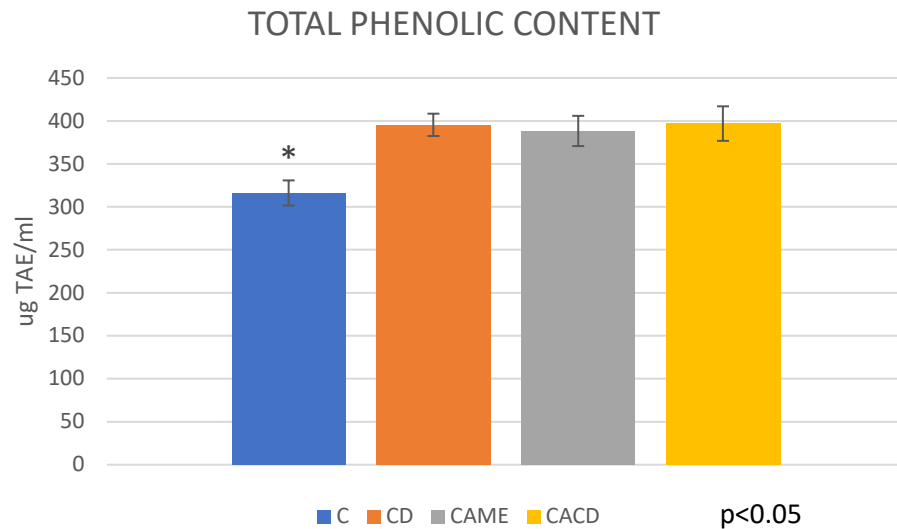


\$: $0.1 < p < 0.05$



Results

COLOSTRUM FUNCTIONAL PROFILE



Conclusions



No differences in performance and blood metabolites

Supplementation of cardoon, camelina alone and in mixture seems to benefit the quality of colostrum and serum antioxidant content



Fatty acid profile





divas

DIPARTIMENTO DI MEDICINA
VETERINARIA E SCIENZE ANIMALI

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