

Use of feed additives around weaning in dairy beef calves

Uso de aditivos en el destete de terneros mamones

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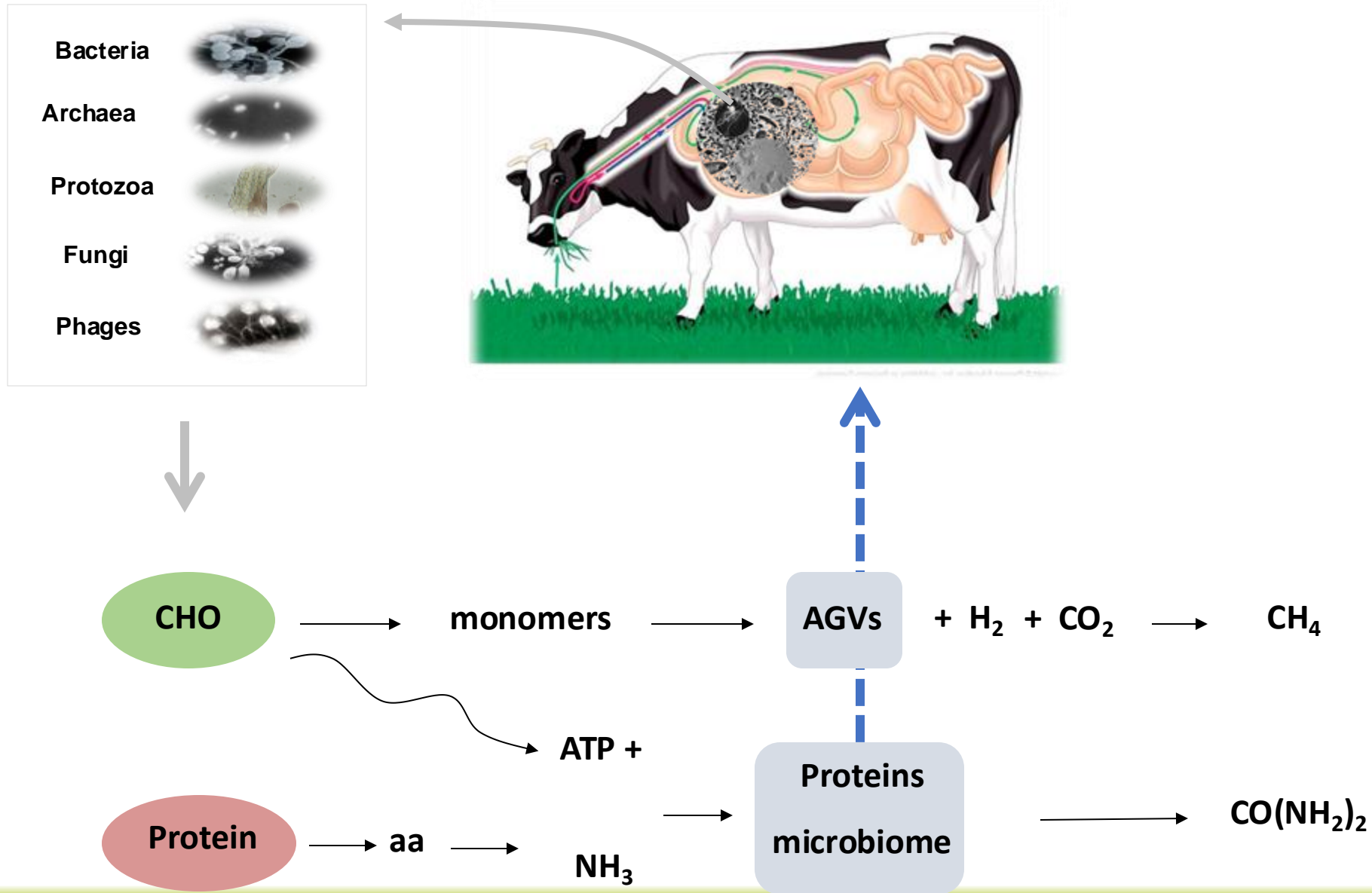
³ Cooperativa d'Ivars, Ivars d'Urgell, Lleida



**COOPERATIVA
D'IVARS**



Rumen microbiome



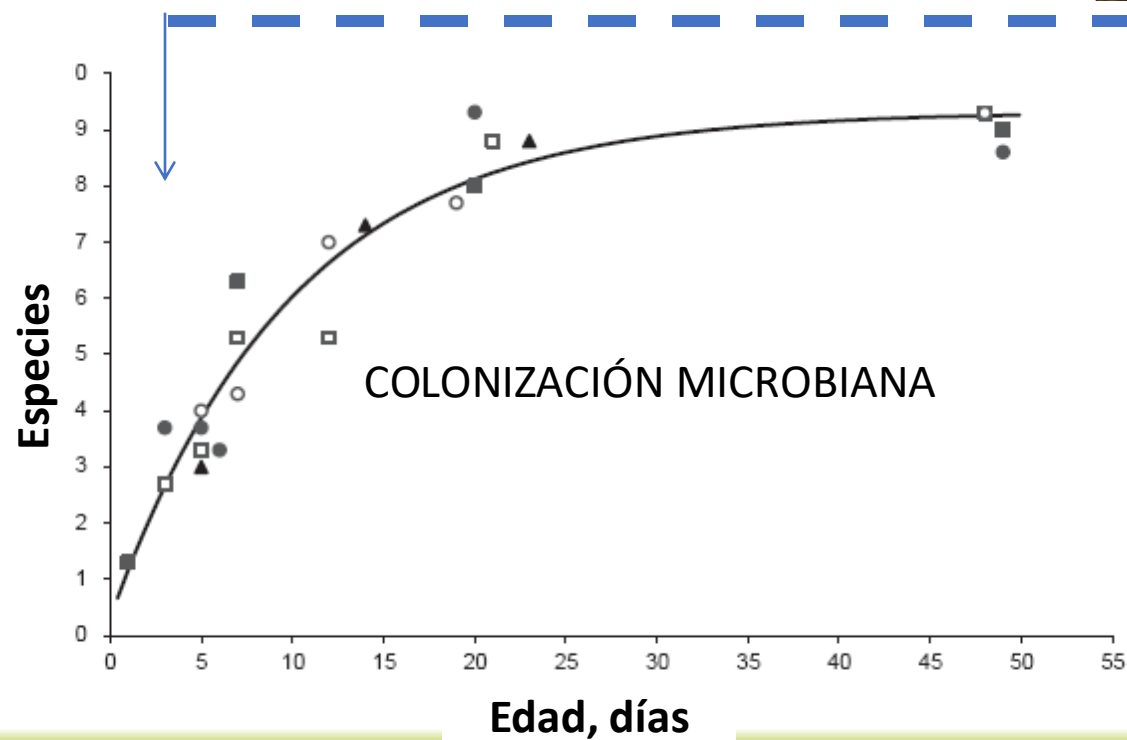
Rumen microbiome



Rumen microbiome: colonization



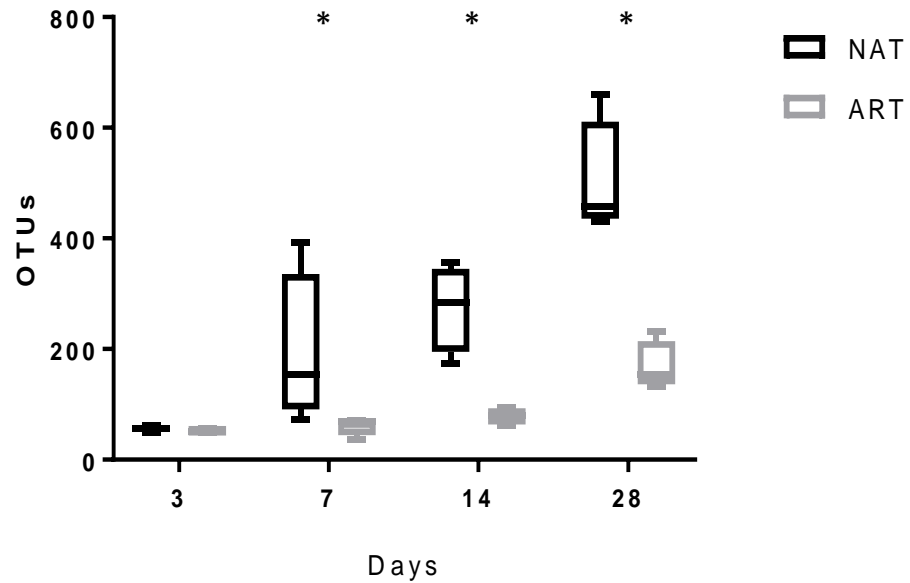
- **High microbiome-host specificity**
- **Redundancy and resilience to change**



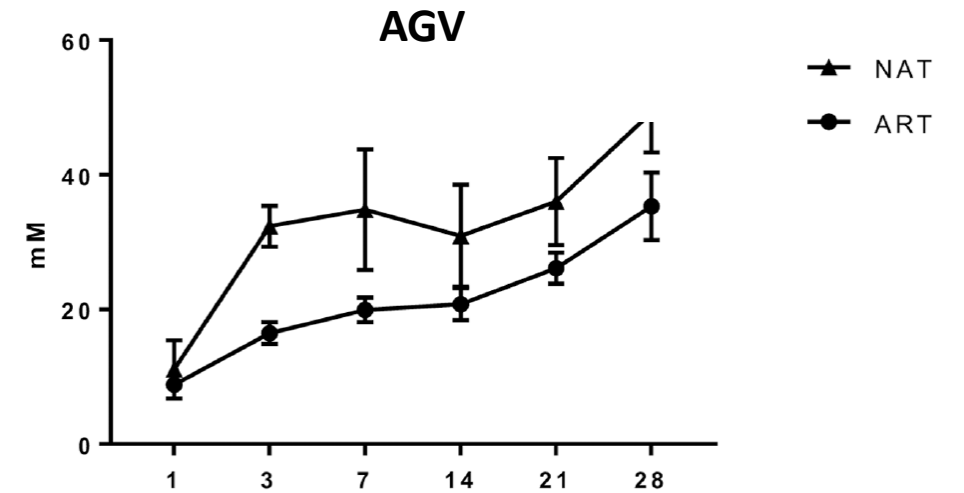
Rumen microbiome: colonization



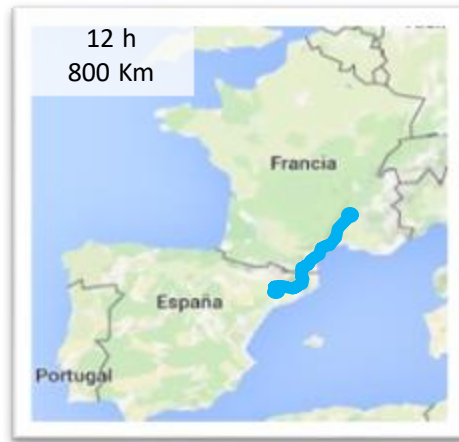
Microbial colonisation



Rumen fermentation

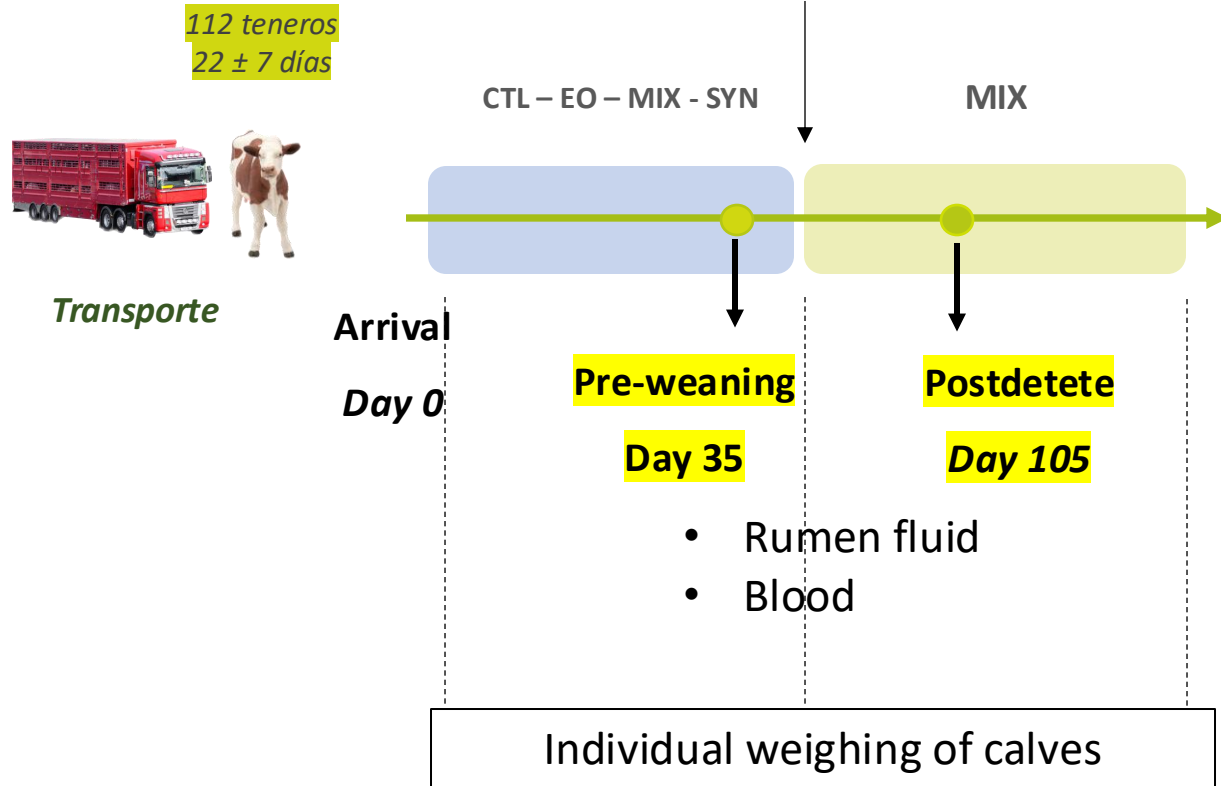


OBJECTIVE OF THE TRIAL



To evaluate the effect of the use of different nutritional additives in pre-weaning on the development of ruminal fermentation.





4 experimental groups of 28 animals (n = 112):

- ✓ **CTL** – Basic diet without additives
- ✓ **MIX** – Butyrate + essential oils + yeast
- ✓ **SYN** – Yeasts (Levucell titan + Yang)
- ✓ **EO** – Essential oil (Digestarom)



Material and methods





Pre-weaning

Parameter	Treatment				SEM	P-value
	CTL ¹	EO ²	SYN ³	MIX ⁴		
pH	6.13	6.19	6.49	5.94	0.17	0.169
Lactic Acid (µg/mL)	35.6	38.1	38.6	33.5	3.07	0.650
Total VFAs (mM)	92.9	101	90.8	104	5.38	0.222
Fatty Acids (%)						
Acetate	46.1 ^a	46.5 ^a	45.4 ^a	43.0 ^b	0.72	0.004
Propionate	37.8	36.0	38.0	40.2	1.09	0.054
Butyrate	10.1	11.1	10.2	10.6	0.71	0.761
Valerate	4.62	4.87	4.48	5.13	0.43	0.716
BCVFA	1.40 ^{ab}	1.62 ^a	1.78 ^a	1.15 ^b	0.17	0.048
A:P	1.26 ^a	1.34 ^a	1.23 ^{ab}	1.09 ^b	0.05	0.010
Microbial population						
Total Bacteria	9.27	9.35	9.32	9.26	0.04	0.273
Archaea	5.65	5.63	5.60	5.47	0.07	0.260
Protozoa	nd	nd	nd	nd		
Fungi	nd	nd	nd	nd		



Postdestete

Parameter	Treatment				SEM	P-value
	CTL ¹	EO ²	SYN ³	MIX ⁴		
pH	6.83 ^a	6.61 ^{ab}	6.41 ^b	6.42 ^b	0.11	0.019
Lactic Acid (µg/mL)	40.3	41.8	41.8	41.2	3.15	0.984
Total VFAs (mM)	76.0 ^b	102 ^a	94.4 ^a	93.8 ^a	4.72	0.002
Fatty Acids (%)						
Acetate	44.8	44.7	45.0	44.7	0.64	0.984
Propionate	42.9	41.4	42.7	41.6	0.81	0.414
Butyrate	7.50 ^b	9.31 ^a	8.28 ^{ab}	9.08 ^a	0.50	0.048
Valerate	3.33	3.22	3.04	3.55	0.22	0.460
BCVFA	1.47 ^a	1.33 ^{ab}	0.91 ^c	1.08 ^{bc}	0.10	0.001
A:P	1.05	1.11	1.07	1.10	0.04	0.710
Microbial population						
Total Bacteria	10.5	10.5	10.6	10.6	0.31	0.997
Archaea	6.33	6.43	6.34	6.39	0.17	0.973
Protozoa	nd	nd	nd	nd		
Fungi	3.20	3.19	3.14	3.22	0.04	0.387





	Parameter	Treatment				SEM	P-value
		CTL ¹	EO ²	SYN ³	MIX ⁴		
Pre-weaning	BHB (mg/dL)	2.33 ^c	3.20 ^a	2.51 ^{bc}	2.88 ^{ab}	0.18	0.004
Postdestete	BHB (mg/dL)	3.07 ^c	3.93 ^b	4.68 ^a	4.56 ^{ab}	0.23	<0.001
	Cortisol (mg/dL)	2.37 ^a	1.61 ^{bc}	1.15 ^c	1.78 ^b	0.18	<0.001





Weight, kg

Parameter	Treatment				SEM	P-value
	CTL ¹	EO ²	SYN ³	MIX ⁴		
Día 0	57.3	57.9	58.5	57.7	0.83	0.775
Día 45	93.2	91.2	90.3	93.9	2.00	0.553
Día 105	161	159	159	162	3.75	0.887

**Coefficients
Variation, %**

Treatment	Día 0	Día 45	Día 105	ADG1	ADG2	TADG
CTL	7.49	14.01	15.17	29.72	20.56	21.36
MIX	6.07	11.26	8.28	26.50	13.32	12.37
EO	8.04	8.90	11.95	17.95	21.85	16.85
SYN	7.95	11.89	11.61	27.72	21.75	18.38





Inclusion of additives in pre-weaning promotes increased ruminal fermentation.

Treatment should be applied before weaning

Although under the conditions of this experiment it has not improved weight gain, it has promoted greater uniformity in weights.





Gracias

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