

NuPro[®] supplementation of milk replacer: Growth and health in dairy calves

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Objective

To investigate the effect of NuPro[®] (Alltech Inc.) on the health status, weight gain and blood chemistry of milk replacer-fed calves.

Methods

- Farm Dobrosev a.s. Dobronin in the Czech Republic.
- 20 Holstein heifers were allocated to treatment groups at 5 d of age (1st d of treatment).
- 2 treatment groups: NuPro[®] (n=10) and control (n=10).
- Trial duration – 56 d (August – September 2008).

Results

Performance

- Because milk replacer was not fed to calves in the NuPro[®] group during the initial days of the experiment, the average daily gain (ADG) for d 1 – 28 was better ($P < 0.05$) in heifers fed the control: 0.23 kg/d (+/- 0.1 kg/d) and 0.33 kg/d (+/- 0.09 kg/d), for NuPro[®] and control treatments, respectively (Table 1).
- In contrast, in the second half of the trial (d 29 – 56) the ADG was better ($P < 0.05$) for heifers fed NuPro[®]: 1.0 kg/d (+/- 0.12 kg/d) and 0.72 kg/d (+/- 0.27 kg/d) for the NuPro[®] and control treatments, respectively.

Metabolic profile

- Few significant differences in metabolic profile parameters were found between treatments for the first half of experiment; NuPro[®]-supplemented calves had higher ($P < 0.05$) concentrations of serum copper on d 14 (Table 2).
- In the second half of experiment, on d 28 and d 56 NuPro[®]-fed calves had higher serum total protein ($P < 0.01$), immunoglobulins (d 28 $P < 0.05$; d 56 $P < 0.01$), and iron ($P < 0.05$). NuPro[®]-supplemented calves also had higher ($P < 0.05$) serum albumin on d 56.
- The control group had higher ($P < 0.05$) serum AST and cholesterol on d 28 and higher ($P < 0.05$) sodium on d 56.

Conclusions

- NuPro[®] significantly increased calf average daily gain from d 29 to 56, resulting in greater live weight by d 56.

Table 1. Calf performance response to NuPro[®] supplementation.

	d 1	d 28	d 56
Live weight, kg			
Control	43.95	53.02	73.11
NuPro [®]	41.82	48.19	76.12
	d 1 – 28	d 29 – 56	d 1 – 56
ADG, kg/d			
Control	0.33	0.72	0.52
NuPro [®]	0.23	1.0*	0.61

* $P < 0.05$

Table 2. Change in metabolic profile parameters with NuPro[®] supplementation.

Parameter	Control				NuPro [®]			
	d 3	d 14	d 28	d 56	d 3	d 14	d 28	d 56
TP g/L	61.18	64.49	63.86	62.84	60.21	63.65	**66.55	**68.67
Alb g/L	35.81	34.85	35.67	37.67	35.46	34.52	36.06	*39.47
Ig g/L	12.15	12.90	14.69	16.37	12.07	13.01	*16.78	**19.7
U mmol/L	2.63	2.75	2.94	2.54	2.52	2.88	3.16	2.93
AST μ kat/L	1.04	1.15	*1.29	1.19	1.01	1.09	1.18	1.23
GMT μ kat/L	4.18	0.42	0.41	0.52	4.1	0.44	0.39	0.49
CK μ kat/L	3.11	39.50	7.51	10.82	2.45	3.35	3.48	4.43
Chol mmol/L	2.64	2.66	*2.89	3.04	2.68	2.54	2.6	2.72
Na mmol/L	137.9	138.6	140.20	*140.5	139.1	139.9	139.7	138.90
K mmol/L	4.73	5.01	4.97	5.06	4.79	4.92	5.08	5.09
Ca mmol/L	2.55	2.54	2.52	2.56	2.54	2.53	2.53	2.57
Mg mmol/L	0.76	0.79	0.886	0.96	0.78	0.81	0.89	0.95
P mmol/L	2.98	2.9	2.832	2.81	3.01	2.81	2.65	2.69
Cl mmol/L	97.88	96.54	102.06	103.13	96.79	100.44	102.66	103.75
Zn mmol/L	18.27	17.31	17.06	17.47	17.41	17.15	17.93	18.22
Cu μ mol/L	8.58	9.01	9.73	9.74	9.14	*9.91	10.6	10.72
Fe μ mol/L	18.28	14.66	16.98	18.62	18.01	14.92	*20.34	*22.94
Vit. A μ mol/L	1.13	1.04	1.24	1.22	1.17	1.05	1.25	1.23
Vit. E μ mol/L	5.09	4.87	4.56	4.62	5.2	4.76	5.57	5.46

* $P < 0.05$; ** $P < 0.01$.

