

## Supplementary material

**Table S1.** Vitamin concentration of vitamin B complex (Vitamin-B-Komplex pro inj., Serumwerk Bernburg AG)

Vitamin	Concentration (mg / mL)
Thiamine chloride hydrochloride	8.0
Cyanocobalamine	0.02
Nicotinamide	20.0
Pyridoxine hydrochloride	0.8
Riboflavin phosphate sodium	0.42
Dexpanthenol	0.84

**Table S2.** Declared chemical composition and feed additives of MR22 and MR19.

Item	Unit	MR22	MR19
Crude ash	%	7.50	6.80
Crude Protein	%	22.0	19.0
Lysine	%	1.80	1.65
Ether extract	%	18.0	18.0
Crude fibre	%	0.10	0.10
Calcium	%	0.80	0.75
Phosphorus	%	0.75	0.65
Magnesium	%	0.20	0.20
Sodium	%	0.70	0.60
Vitamin A	I.E./kg	100,000	100,000
Vitamin D <sub>3</sub>	I.E./kg	10,000	10,000
Vitamin E	mg/kg	200	200
Vitamin K	mg/kg	5.00	5.00
Vitamin C	mg/kg	450	450
Vitamin B <sub>1</sub>	mg/kg	15.0	15.0
Vitamin B <sub>2</sub>	mg/kg	24.0	24.0
Vitamin B <sub>6</sub>	mg/kg	6.60	6.60
Vitamin B <sub>12</sub>	mg/kg	66.0	66.0
Niacin	mg/kg	100	100
Pantothenic acid	mg/kg	50	50
Choline chloride	mg/kg	313	313
Iron	mg/kg	90.0	90.0
Copper	mg/kg	9.00	9.00
Zinc	mg/kg	37.0	37.0
Manganese	mg/kg	28.0	28.0
Iodine	mg/kg	0.40	0.40
Selenium	mg/kg	0.20	0.20
Pucoferm <sup>1</sup>	10 <sup>9</sup> CFU	1.00	1.00

<sup>1</sup> Enterococcus faecium M74 (NCIMB 11181, 4b1708), Pulte GmbH & Co. KG, Prien, Germany

**Table S3.** Colostrum and whole milk intake (mean  $\pm$  SD) of groups MR22 and MR19 during the first week of life, given in L/calf/d.

Day of life	MR22	MR19
Birth	3.9 $\pm$ 1.7	3.5 $\pm$ 2.0
1	4.4 $\pm$ 1.4	4.9 $\pm$ 1.7
2	5.5 $\pm$ 1.4	6.5 $\pm$ 1.4
3	7.1 $\pm$ 1.0	7.2 $\pm$ 1.3
4	8.3 $\pm$ 1.2	8.0 $\pm$ 1.3
5	8.5 $\pm$ 1.6	8.6 $\pm$ 1.1
6	7.9 $\pm$ 3.2	7.6 $\pm$ 2.4
7	4.8 $\pm$ 2.6	5.2 $\pm$ 2.9

**Table S4.** Weekly intake of dry matter (DM, mean  $\pm$  SD) and crude protein (CP, mean  $\pm$  SD) by milk replacer of groups MR22 and MR19 during pre-transition and transition period, given in g/calf/d.

Trial period	Age (days)	DM		CP	
		MR22	MR19	MR22	MR19
Pre-transition	9-15	1060 $\pm$ 209	1042 $\pm$ 239	231 $\pm$ 45.5	193 $\pm$ 44.2
	16-22	1388 $\pm$ 205	1383 $\pm$ 243	303 $\pm$ 44.8	256 $\pm$ 45.0
	23-29	1434 $\pm$ 184	1433 $\pm$ 165	313 $\pm$ 40.1	265 $\pm$ 30.5
	30-36	1426 $\pm$ 158	1408 $\pm$ 209	311 $\pm$ 34.4	261 $\pm$ 38.7
	37-42	1447 $\pm$ 148	1397 $\pm$ 196	315 $\pm$ 32.3	259 $\pm$ 36.3
Transition	43-49	1037 $\pm$ 46.7	1035 $\pm$ 60.7	226 $\pm$ 10.2	192 $\pm$ 11.2
	50-56	772 $\pm$ 24.8	775 $\pm$ 27.7	168 $\pm$ 5.40	143 $\pm$ 5.13
	57-63	470 $\pm$ 7.46	462 $\pm$ 19.5	102 $\pm$ 1.62	85.4 $\pm$ 3.61
	64-70	149 $\pm$ 18.6	140 $\pm$ 13.2	32.6 $\pm$ 4.05	25.9 $\pm$ 2.44