

**Corso d'aggiornamento
Piacenza 19-20 Settembre 2012**

ALIMENTAZIONE DELLA VACCA DA LATTE

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ALIMENTAZIONE DELLA VITELLE IN SVEZZAMENTO

Nutrient	Amount required
Crude protein (% of DM)	18.0
Fat (% of DM)	3.0
TDN (% of DM)	80.0
Metabolizable energy (Mcal/kg DM)	3.11
Calcium (% of DM)	0.60
Phosphorous (% of DM)	0.40
Vitamin A (IU/kg)	2,200
Vitamin E (IU/kg)	25*
Vitamin D (IU/kg)	300

Fabbisogni nutritivi dei vitelli di razze da latte 1989 NRC

ALIMENTAZIONE DELLA MANZA

FABBISOGNI NUTRITIVI PER L'ACCRESIMENTO

NRC 2001 INRA 1989	6 MESI BCS=3.0 Kg 200 + 0.8 Kg /die	12 MESI BCS=3.0 Kg 300 + 0.8 Kg /die	18 mesi BCS= 3.0 Kg 450 + 0.8 Kg /die
Sostanza secca Kg	5.2	7.1	11.3
EM (Mcal/Kg)	2.04	2.28	1.79
UFL %/ s.s	0.77	0.73	0.72
Proteina grezza % / s.s.	12.7	12.3	9.4
NDF % s.s. minimo	30-33	30-33	30-33
ADF % s.s. minimo	20-21	20-21	20-21
NFC % s.s massimo	34-38	34-38	34-38
Calcio % s.s.	0.41	0.41	0.37
Fosforo % s.s.	0.28	0.23	0.18
Vitamina A UI/die	16.000	24.000	36.000
Vitamina D3 UI/die	6.000	9.000	13.500
Vitamina E UI/die	160	240	360

**ALIMENTAZIONE
DEGLI
ULTIMI 60 GIORNI DI
GESTAZIONE**

FABBISOGNI NUTRITIVI DELLA VACCA IN ASCIUTTA

Giorni di gravidanza		240	270	279
Peso corporeo Kg		730	751	279
Età mesi		57	58	58
Ingestione kg/s.s.		14.4	13.7	10.1
Enl Mcal/die		14.0	14.4	14.5
Enl Mcal/Kg		0.97	1.05	1.44
Mp gr/die		871	901	810
Mp % s.s.		6.0	6.6	8.0
Rdp gr/die		1114	1197	965
Rdp %/s.s.		7.7	8.7	9.6
Uip gr/die		317	292	286
Uip % s.s.		2.2	2.1	2.8
Proteina grezza(Uip+Dip)		9.9	10.8	12.4
NDF min % s.s.		33	33	33
ADF max % s.s.		21	21	21
NFC max % s.s.		42	42	42
Calcio % s.s.		0.44	0.45	0.48
Fosforo % s.s.		0.22	0.23	0.26
Magnesio % s.s.		0.11	0.12	0.16
Cloro % s.s.		0.13	0.15	0.20
Potassio % s.s.		0.51	0.52	0.62
Sodio % s.s.		0.10	0.10	0.14
Zolfo % s.s.		0.20	0.20	0.20
Cobalto mg/Kg		0.11	0.11	0.11
Rame mg/Kg		12	13	18
Iodio mg/Kg		0.4	0.4	0.5
Ferro mg/Kg		13	13	18
Manganese mg/Kg		16	18	24
Selenio mg/Kg		0.3	0.3	0.3
Zinco mg/Kg		21	22	30
Vitamina A UI/Kg		5576	6030	8244
Vitamina D UI/Kg		1520	1645	2249
Vitamina E UI/Kg		81	88	120

HOLSTEIN MATURE
Kg 680 (senza feto)
Bcs 3.3
Vitello Kg 45

NRC 2001

		Early-dry BCS 3.0-3.5	Early – dry BCS > 3.5	
peNDF	%SS	47	43	
NFC	%SS	27	25	
Zuccheri	%SS	2.5	2	
Frazione B1 (pectine + β Glucani)	%SS	6	4	
Amido	%SS	14		
Proteina grezza	%SS	12		
Proteina solubile	% Pg	≤ 40		
RDP	% Pg	70		
RUP	% Pg	30		
		AMBIENTE SCARSO	AMBIENTE MEDIO	AMBIENTE BUONO
Lipidi totali	%SS	4-6	3-4	2-3
Insaturi	%SS	3	2	2
Saturi	%SS	2	1	0-1
By-pass	%SS	2	0-1	0



FABBISOGNI NUTRITIVI PER CLOSE-UP

		primipare	Pluripare normale	Pluripare anioniche
Sostanza secca	Kg/die	10.6		
Enl	(Mcal / Kg s.s.)	16.9	22.0	21.5
Enl	(Mcal / die)	1.59	1.61	1.58
MP	gr/die	1027		1133
MP	% s.s.	9.7	8.5	8.3
RDP	gr/die	1067	1104	1075
RDP	% s.s.	10.2	8.1	7.8
RUP	gr/die	511	640	621
RUP	% s.s.	4.9	4.7	4.5
Proteina greggia (Uip+Dip)	% s.s.	15.0	12.8	12.3
NDF min	% s.s.	39	38.2	37.2
ADF min	% s.s.	23.4	22.4	21.8
NFC max	% s.s.	39.4	42.8	41.6
Calcio	% s.s.	0.44	0.43	0.98
Fosforo	% s.s.	0.37	0.3	0.37
Magnesio	% s.s.	0.4	0.39	0.38
Cloro	% s.s.	0.44	0.42	0.89
Potassio	% s.s.	1.54	1.35	1.32
Sodio	% s.s.	0.13	0.16	0.15
Zolfo	% s.s.	0.19	0.18	0.31
Cobalto	mg/Kg	0.11	0.11	0.11
Rame	mg/Kg	16	13	13
Iodio	mg/Kg	0.4	0.4	0.4
Ferro	mg/Kg	26	13	13
Manganese	mg/Kg	22	18	18
Selenio	mg/Kg	0.3	0.3	0.3
Zinco	mg/Kg	30	22	22
Vitamina A	UI/Kg	7075	7300	7300
Vitamina D	UI/Kg	1887	1824	1824
Vitamina E	UI/Kg	113	132	132
DCAD	meq/ Kg	203	185	- 41

NRC 2001

		primipare	pluripare	Pluripare Anionica
Ingestione	Kg/ss	10.6	12.6	12.5
ENERGIA				
Enl	Mcal/die	16.9	22	21.5
Enl	Mcal/kg	1.6	1.6	1.58
PROTEINA				
Pg	% ss	14	14	14
Pg (Dip-Uip)	%ss	15	12.8	12.3
Pg sol	% Pg	< 30	<30	<30
Rdp	gr/die	1067	1104	1075
Rdp	% ss	10.2	8.1	7.8
Uip	gr/die	511	640	621
Uip	% ss	4.9	4.7	4.5
Mp	gr/die	1027	1133	1133
Mp	% ss	9.7	8.5	8.3
CARBOIDRATI				
NDF min	%ss	39	38	37
ADF max	%ss	23.4	22.4	21.8
peNDF (0.8%pv)	%ss	31	31	31
NFC	%ss	36	36	36
NSP (B1)	%ss	4	4	4
Amido	%ss	24	24	24
GRASSI				
Lipidi totali	%ss			
Insaturi	%ss			
Saturi	%ss			
By -pass	%ss			

FABBISOGNI NUTRITIVI CLOSE-UP

Sniffen 2004

ALIMENTAZIONE DELLA VACCHE IN LATTAZIONE

	% max nei concentrati	Massima % nell'unifeed sulla s.s.
Medica disidratata	20	10
Orzo	0-35p	0-14p
Polpe	25-40p	10-16p
Fagiolo e piselli	15-20p	6-8p
Trebbie di birra secche	20-30p	8-12p
Trebbie di birra umide	45	22
Mais	0-35p	0-14p
Semola glutinata di mais	20-30p	8-12p
Glutine di mais	12p	6
Citrus pulp	25-40p	10-16p
Cocco farina	20-25p	8-10p
Cotone farina	20	8
Distiller secchi	25-35p	10-14p
Distillers umidi	35	17
Grassi ed oli	3.5	2
Sorgo	30-40p	15-20p
Melasso	10	3
Avena	0-40p	0-16p
Arachidi farina	10-15p	0-5p
Riso	10-15p	4-6p
Bucette di soia	25	10
Triticale	20-35p	8-14p
Urea	1.5	1
Grano	20-35p	8-14p
Cruscamì	25-30p	12-15p
Farinaccio	15-20p	7-10p
Minerali totali	5-6p	2.5-3p
Cotone integrale	20	10

Giorni medi lattazione		11	11
Produzione chili		25	35
Ingestione	Kg / s.s.	13.5	15.6
Variazioni di peso	Kg/ die	- 0.9	- 1.6
Giorni per perdere 1 BCS		99	55
Enl	Mcal / die	27.9	34.8
Enl	Mcal / Kg	2.06	2.23
MP	gr / die	1643	2157
MP	% / s.s.	12.2	13.8
RDP	gr / die	1421	1634
RDP	% / s.s.	10.5	10.5
RUP	gr / die	949	1405
RUP	% / s.s.	7.0	9.0
Proteina grezza RUP+RDP %		17.5	19.5
NDF min	% / s.s.	25 – 33	25 – 33
ADF min	% / s.s.	17 – 21	17 – 21
NFC max	% / s.s.	36 – 44	36 – 44
Calcio	% / s.s.	0.74	0.79
Fosforo		0.38	0.42
Magnesio		0.27	0.29
Cloro		0.36	0.40
Potassio		1.19	1.24
Sodio		0.34	0.34
Zolfo		0.20	0.20
Cobalto	mg / Kg	0.11	0.11
Rame		16	16
Iodio		0.88	0.77
Ferro		19	22
Manganese		21	21
Selenio		0.3	0.3
Zinco		65	73
Vitamina A	UI / Kg	5540	4795
Vitamina D		1511	1308
Vitamina E		40	35

**FABBISOGNI
NUTRITIVI
FRESCA**

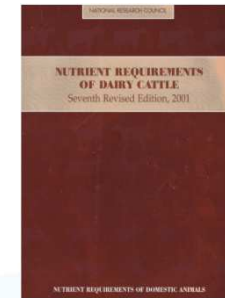
- **HOLSTEIN**
- **Kg 680**
- **BCS 3.3**
- **Età 58 mesi**
- **Grasso 3.5 %**
- **Proteina 3.0 %**
- **Lattosio 4.8 %**
- **Ambiente neutro**

NRC 2001

TABLE 14-7 Nutrient Requirements of Lactating Dairy Cows as Determined Using Sample Diets

Days in milk	Holstein = 680 kg livewt, Mature Bwt = 680 kg, BCS = 3.0, 65 mos age, Milk fat = 3.5%, milk true protein = 3.0%, lactose = 4.8%, Default environmental conditions				Jersey = 454 kg livewt, mature Bwt = 454 kg, BCS = 3.0, 65 mos age, milk fat = 4.2%, milk true protein = 3.6%, lactose = 4.8% Default environmental conditions					
	90 Model predicted	90 Model predicted	90 Model predicted	90 Model predicted	90 Model predicted	90 Model predicted ^a	90 Model predicted	50 Model predicted ^a	120 Model predicted ^a	90 Model predicted + 5% ^b
Dry matter intake input										
Milk production (kg)	25	35	45	54.4	25	35	40	35	35	35
Milk production (lbs)	55	77	99	120	55	77	88	77	77	77
Dry matter intake (kg)	20.3	23.6	26.9	30	18	21.7	23.5	19.8	22.2	22.7
Dry matter intake (lbs)	44.7	51.9	59.2	66	39.6	47.7	51.7	43.6	48.8	49.9
Daily wt change (kg)	0.5	0.3	0.1	-0.2	0	-0.2	-0.5	-0.7	-0.1	0
Days to gain one condition score	221	316	1166		3777					4247
Days to lose one condition score				544		241	110	80	532	
Energy ^c										
NE _L (Mcal/day)	27.9	34.8	41.8	48.3	27.7	35.6	39.5	35.6	35.6	35.6
NE _L (Mcal/kg)	1.37	1.47	1.55	1.61	1.54	1.64	1.68	1.8 a	1.6	1.57
NE _L (Mcal/lb)	0.62	0.67	0.7	0.73	0.7	0.74	0.76	0.82	0.73	0.71
Protein										
Metabolizable protein (g/d)	1862	2407	2954	3476	1991	2639	2965	2579	2656	2672
Diet % MP	9.2	10.2	11	11.6	11.1	12.2	12.6	13	12	11.8
Rumen degradable protein (g/d)	1937	2298	2636	2947	1747	2125	2288	1971	2167	2206
Diet % RDP	9.5	9.7	9.8	9.8	9.7	9.8	9.7	10	9.8	9.7
Rumen undegradable protein (g/d)	933	1201	1677	2089	1151	1632	1865	1670	1619	1611
Diet % RUP	4.6	5.5	6.2	6.9	6.4	7.5	7.9	8.4	7.3	7.1
% RDP + % RUP (crude protein) ^b	14.1	15.2	16.0	16.7	16.1	17.3	17.6	18.4	17.1	16.8
Fiber and carbohydrate ^c										
NDF, min %	25-33	25-33	25-33	25-33	25-33	25-33	25-33	25-33	25-33	25-33
ADF, min %	17-21	17-21	17-21	17-21	17-21	17-21	17-21	17-21	17-21	17-21
NFC, max %	36-44	36-44	36-44	36-44	36-44	36-44	36-44	36-44	36-44	36-44
Minerals										
Absorbable calcium (g/day)	52.1	65	76.5	88	50.7	65.2	72.4	65.2	65.2	65.2
Dietary Ca %	0.62	0.61	0.67	0.6	0.57	0.57	0.63	0.66	0.54	0.53
Absorbable phosphorus (g/day)	44.2	56.5	68.8	80.3	41.4	54.1	60.4	52.2	54.6	55.1
Dietary P %	0.32	0.35	0.36	0.38	0.33	0.37	0.36	0.44	0.35	0.34
Mg ^d %	0.18	0.19	0.2	0.21	0.18	0.19	0.2	0.21	0.19	0.19
Cl %	0.24	0.26	0.28	0.29	0.24	0.26	0.27	0.28	0.25	0.25
K ^e %	1	1.04	1.06	1.07	1.02	1.03	1.04	1.07	1.03	1.02
Na %	0.22	0.23	0.22	0.22	0.2	0.2	0.2	0.22	0.2	0.19
S %	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Co mg/kg	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Cu mg/kg	11	11	11	11	10	10	10	11	10	9
I mg/kg ^f	0.6	0.5	0.44	0.4	0.44	0.4	0.34	0.4	0.36	0.35
Fe mg/kg	12.3	15	17	18	14	16	17	18	16	15
Mn mg/kg	14	14	13	13	12	12	12	13	12	12
Se mg/kg	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Zn mg/kg	43	48	52	55	45	49	51	54	48	47
Vitamin A (IU/day)	75000	75000	75000	75000	49500	49500	49500	49500	49500	49500
Vitamin D (IU/day)	21000	21000	21000	21000	13500	13500	13500	13500	13500	13500
Vitamin E (IU/day)	545	545	545	545	360	360	360	360	360	360
Vitamin A (IU/kg)	3685	3169	2780	2500	2772	2300	2123	2520	2247	2198
Vitamin D (IU/kg)	1004	864	758	680	735	627	579	687	613	600
Vitamin E (IU/kg)	27	23	20	18	20	17	16	18	16	16
Sample diets used in model to generate tables. Ingredients listed as kg /day DM.										
Corn silage, normal	8.48	8.21	5.61	12.02	8.96	7.77	7.39	7.1	7.96	8.15
Soybean meal, scv, 48% CP	1.01	1.62	1.41	2.39	2.16	2.78	1.67	2.54	2.85	2.91
Legume forage silage, mid-maturity	3.85	4.57			2.67	3.1		2.83	3.18	3.25
Corn grain, steam flaked	1.8	4.33	7.08	6.35	2.6	4.91	5.88	4.48	5.03	5.15
Calcium carbonate	0.04	0.07	0.09	0.02	0.06	0.04	0.03	0.04	0.04	0.04
Monosodium phosphate (1 H2O)	0.02	0.02	0.04	0.06	0.01	0.01	0.03	0.01	0.01	0.01
Soybean meal, expellers							1.16			
Legume forage hay, immature			6.16	5.42			4.59			
Sodium chloride	0.12	0.011	0.12	0.14	0.1	0.1	0.12	0.09	0.1	0.1
Grass hay, c-3, mid-mat	4.47	3.21	0.98	0.83	0.85	0.95	0.97			
Vitamin and mineral premix	0.54	0.49	0.51	0.49	0.5	0.5	0.5	0.45	0.51	0.52
Bermudagrass hay, coastal			0.87							

Continues



RAZIONE VACCHE IN LATTAZIONE

	Parametro	U.M.	Razione	Target	Min	MAX
Parametri generali	DMI attuale	kg/giorno	23,98			
	DMI	% prev.		100,0	98,0	112,0
	ME Bilancio	Mcal/giorno	1,40	1,0	-1,0	3,0
	ME Bilancio	% rich.	102,59	101,85	98,15	105,54
	MP Bilancio	gr/giorno	43,90	0	-23,98	119,91
	MP Bilancio	% rich.	101,85	100,0	99,0	105,0
	NP/MP		67,00	65,0	60,0	70,0
	Var.riserve	kg/giorno	0,26	0,00	0,23	0,45
Carboidrati	NFC	% SS	33,66	36,0	35,0	40,0
	Zuccheri (CHO A4)	% SS	2,94	5,0	4,0	9,0
	Amidi (CHO B1)	% SS	23,39	25,0	21,0	28,0
	Fibre Solubili (CHO B2)	% SS	4,64	7,0	5,0	11,0
	NDF	% SS	36,66	31,0	28,0	35,0
	peNDF	% SS	28,32	23,0	21,0	28,0
	CHO C	% SS	8,60	< 10,0		
Fermentescibilità	Sostanza Secca	% SS	47,06	50,0	48,0	52,0
	Zuccheri	% SS	2,13	4,5	3,8	6,7
	Amidi	% SS	17,29	19,0	15,0	22,0
	Fibre Solubili	% SS	3,84	6,0	4,0	9,5
	NDF (CHO B3)	% SS	12,83	10,5	8,5	13,5
	NDF (CHO B3)	% NDF	34,99	> 32,0	30,0	38,0
Lipidi	EE 1	% SS	2,40			3,0
	EE 2	% SS	1,64			3,0
	EE 1 e 2	% SS	4,04			5,0
	EE 3	% SS				4,0
	EE Totale	% SS	4,04	4,0	2,0	6,0
	TFA	% SS	3,37	3,5	1,8	5,00
	Totale AG Insaturi	gr/giorno	601,13	< 500,0		600,0
	C18:1trans	gr/giorno	77,53	< 100,0		120,0
Bilancio Ruminale	N-NH3 ruminale	% rich.	200,83	120,0	105,0	160,0
	N-Peptidi	% rich.	175,09		100,0	180,0
	Proteine solubili	% PG	31,27	31,0	30,0	35,0
	RDP	% SS	10,29	9,0	8,5	10
Bilancio AA - Rulquin	Met	% MP	1,97	2,40	2,30	2,45
	Lys	% MP	6,04	6,68	6,60	6,84
	Lys:Met		3,07:1	[2,82 : 1]	[2,78 : 1]	[2,95 : 1]

	Aminoacidi									
	MP			Apporti AA			Flusso duodenale AA			
	Rulquin	% Fab.	Bilancio	Fab.	Totali	Batt.	RUP	Totali	Batt.	RUP
	AA % MP		gr/giorno	gr/giorno	gr/giorno	gr/giorno	gr/giorno	gr/giorno	gr/giorno	gr/giorno
Met	1,97	126,4%	10,0	37,7	47,6	30,8	16,8	61,9	42,2	19,7
Lys	6,04	116,7%	20,9	125,4	146,3	94,1	52,2	183,7	120,9	62,8
Arg	6,48	113,4%	18,6	138,5	157,1	79,9	77,2	189,7	98,2	91,6
Thr	4,66	161,5%	43,0	69,9	112,9	64,2	48,7	138,4	80,0	58,4
Leu	8,58	123,6%	39,7	168,1	207,8	86,2	121,6	258,7	114,4	144,3
Ile	4,87	115,6%	15,9	102,1	118,0	67,5	50,5	147,3	86,6	60,7
Val	5,44	111,7%	13,8	117,9	131,7	70,7	61,0	166,7	93,2	73,5
His	2,57	141,9%	18,4	43,8	62,2	30,9	31,3	76,3	39,2	37,1
Phe	5,19	179,6%	55,7	70,0	125,7	59,2	66,5	158,7	79,3	79,4
Trp	1,39	137,3%	9,2	24,6	33,8	18,7	15,1	45,3	26,5	18,8

COME SI APPORTANO

Sale	Ca	P	S	Na	Cl	Mg	K	Fe	Cu	Zn	Mn	I	Se	Co
Fosfato di ammonio		24,7	1,5					17,4		100	400			
Fosfato monocalcico	16,4	21,6	1,2					15,8		90,0	360			
Fosfato bicalcico	22,0	19,3	1,1					14,4		100	300			
Fosfato tricalcico (*)	38,0	20,0												
Fosfato monosodico x H ₂ O		22,5		16,7										
Tripolifosfato		25,0		31,0				40,0						
Carbonato di calcio	39,4							300			300			
Carbonato di zinco (*)										52,0				
Carbonato di Mg					30,8			220						
Carbonato di Mn										478				
Bicarbonato di Na				27,0										
Bicarbonato di K						39,0								
Rocce calcaree	34,0					2,1		3,5						
Rocce fosfatiche	35,0	13,0						16,8		100	200			
Rocce dolomitiche	22,3					10,0		770						
Solfato di Ca x 2 H ₂ O	22,3		18,6											
Solfato di Cu x 5 H ₂ O			12,8						254					
Solfato di Fe x 7 H ₂ O			12,3					218						
Solfato di Zn x H ₂ O			17,7							363				
Solfato di Mn x 5 H ₂ O (*)			—							22,0				
Solfato di Co x 7 H ₂ O (*)			—											22,0
Solfato di Mg x H ₂ O (*)			22,0			17,0								
Ossido di Mg	3,0					56,2					100			
Ossido di Zn										780				
Ossido di Mn											478			
Farina di ossa	30,7	12,9	2,5	5,7				26,7		100				
Cloruro di Na				39,3	60,7									
Cloruro di Mg x 6 H ₂ O (*)						—	12							
Cloruro di K					47,3		50,0	600						
Iodato di Ca (*)	—											65		
Ioduro di K							21					682		
Selenite di Na				26,6									456	

