

Supplementary material 3. Association of selected equine casein 5'-flanking variants, gene expression and basic milk composition.

Table 1. Alpha-s1 casein (CSN1S1).

SNP	Genotype	CSN1S1						Basic milk components									
		mRNA (RA)			Milk protein concentration (g/L)			Protein (g/100mL)			Fat (g/100mL)			Lactose (g/100mL)			
		PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	
c.-1918T>A	AA	n/a	n/a	521.68 (144.98)	n/a	n/a	3.37 (0.33)	n/a	n/a	1.59 (0.07)	n/a	n/a	1.97 (0.23)	n/a	n/a	6.56 (0.08)	
	TA			462.37 (83.70)			3.28 (0.19)			1.70 (0.04)			1.86 (0.13)			6.46 (0.04)	
	TT			472.91 (60.05)			3.62 (0.13)			1.73 (0.02)			1.70 (0.09)			6.42 (0.03)	
c.-1665C>T	CC	n/a	639.12 (56.89)	n/a	n/a	3.76 (0.11)	n/a	n/a	1.79 (0.02)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
	TC		481.30 (95.35)			3.66 (0.19)			1.80 (0.03)								1.43 (0.11)
c.-2168G>C	CG		648.43 (104.14)			3.9225 (0.21)			1.77 (0.03)								1.37 (0.06)
	GG	582.94 (56.12)	3.68 (0.11)	1.80 (0.02)													

n/a – not analyzed due to low frequency of given polymorphism

Table 2. Alpha-s2 casein (CSN1S2). Values marked with different lowercase letters differed significantly (p<0.05).

SNP	Genotype	CSN1S2						Basic milk components								
		mRNA (RA)			Milk protein concentration (g/L)			Protein (g/100mL)			Fat (g/100mL)			Lactose (g/100mL)		
		PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH
c.-2047_-2048insAT	ins/ins	n/a	133.69 (29.84)	206.63 (169.77)	n/a	0.53 (0.05)	0.40 (0.22)	n/a	1.80 (0.02)	1.83 ^a (0.09)	n/a	1.62 (0.22)	1.58 (0.33)	n/a	6.45 (0.04)	6.38 (0.12)
	ins/del		173.70 (31.17)	249.01 (75.92)		0.55 (0.05)	0.62 (0.09)		1.81 (0.02)	1.83 ^a (0.04)		1.66 (0.16)	1.82 (0.15)		6.50 (0.04)	6.42 (0.05)
	del/del		232.66 (54.05)	237.11 (45.94)		0.56 (0.08)	0.54 (0.05)		1.72 (0.04)	1.66 ^b (0.02)		1.577 (0.07)	1.78 (0.09)		6.45 (0.07)	6.46 (0.03)
c.-2121T>C	CC	n/a	211.75 (54.69)	n/a	n/a	0.67 (0.08)	n/a	n/a	1.80 (0.04)	n/a	n/a	1.41 (0.14)	n/a	n/a	6.52 (0.07)	n/a
	TC		159.57 (27.95)			0.52 (0.04)			1.79 (0.02)			1.34 (0.07)			6.49 (0.03)	
	TT		150.84 (34.87)			0.53 (0.05)			1.80 (0.02)			1.42 (0.09)			6.43 (0.04)	

n/a – not analyzed due to low frequency of given polymorphism

Table 3. Beta casein (CSN2). Values marked with different lowercase letters differed significantly (p<0.05).

SNP	Genotype	CSN2						Basic milk components									
		mRNA (RA)			Milk protein concentration (g/L)			Protein (g/100mL)			Fat (g/100mL)			Lactose (g/100mL)			
		PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	
c.-2105C>G	CC	1468.14^a (129.66)	733.46 (81.47)	1079.25 (133.51)	1.54 (0.11)	1.43 (0.08)	1.67 (0.09)	1.65 (0.03)	1.80 (0.02)	1.72 (0.02)	1.52 (0.08)	1.41 (0.05)	1.84 (0.09)	6.51^a (0.02)	6.48 (0.02)	6.45 (0.03)	
	GC	2103.93^b (281.78)	779.83 (79.41)	920.46 (210.06)	1.45 (0.11)	1.37 (0.18)	1.41 (0.15)	1.65 (0.03)	1.77 (0.03)	1.68 (0.041)	1.65 (0.08)	1.22 (0.12)	1.66 (0.13)	6.41^b (0.02)	6.45 (0.06)	6.43 (0.04)	
c.-2429C>T	CC	773.73 (70.23)	n/a	n/a	1.58 (0.09)	n/a	n/a	n/a	n/a	n/a	1.61 (0.07)	n/a	n/a	6.48 (0.02)	n/a	n/a	
	CT	754.90 (103.58)			1.37 (0.14)						1.62 (0.04)			1.57 (0.11)			6.46 (0.03)
	TT	500.46 (286.63)			1.03 (0.40)						1.47 (0.12)			1.47 (0.31)			6.25 (0.10)
c.-2973C>G	CC	659.14 (91.28)	n/a	931.90 (128.12)	1.47 (0.13)	n/a	1.50^a (0.09)	1.64 (0.04)	n/a	1.70 (0.02)	n/a	n/a	1.77 (0.08)	n/a	n/a	n/a	
	CG	847.49 (83.08)		1331.52 (219.35)	1.51 (0.12)		1.82^b (0.16)	1.65 (0.03)		1.75 (0.04)			1.83 (0.15)				
	GG	731.52 (142.31)		n/a	1.54 (0.21)		n/a	1.65 (0.06)		n/a			n/a				

n/a – not analyzed due to low frequency of given polymorphism

Table 4. Kappa-casein (CSN3). Values marked with different lowercase letters differed significantly ($p < 0.05$).

SNP	Genotype	CSN3						Basic milk components								
		mRNA (RA)			Milk protein concentration (g/L)			Protein (g/100mL)			Fat (g/100mL)			Lactose (g/100mL)		
		PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH
c.-3711T>C	CC	12.19 (5.08)	n/a	27.81 (15.21)	0.51 (0.05)	n/a	0.55^a (0.09)	1.54 (0.06)	n/a	1.59^a (0.06)	1.47 (0.16)	n/a	1.97 (0.24)	6.50 (0.05)	n/a	6.56 (0.08)
	TC	15.54 (2.70)		43.69 (8.78)	0.56 (0.02)		0.65^a (0.05)	1.67 (0.03)		1.63^a (0.03)	1.63 (0.08)		1.73 (0.13)	6.46 (0.03)		6.44 (0.05)
	TT	22.39 (3.30)		39.01 (6.30)	0.57 (0.03)		0.79^b (0.03)	1.66 (0.04)		1.77^b (0.02)	1.57 (0.10)		1.78 (0.09)	6.46 (0.03)		6.43 (0.03)
c.-3669G>C	CC	12.23 (4.54)	n/a	27.81 (15.21)	0.49 (0.04)	n/a	0.55^a (0.09)	1.58 (0.05)	n/a	1.59^a (0.06)	1.44 (0.14)	n/a	1.97 (0.24)	6.49 (0.04)	n/a	6.56 (0.08)
	GC	16.49 (2.95)		43.69 (8.78)	0.56 (0.02)		0.65^a (0.05)	1.66 (0.03)		1.63^a (0.03)	1.66 (0.09)		1.73 (0.13)	6.45 (0.03)		6.43 (0.04)
	GG	21.74 (3.15)		39.01 (6.30)	0.58 (0.03)		0.79^b (0.03)	1.67 (0.04)		1.77^b (0.02)	1.58 (0.09)		1.78 (0.09)	6.47 (0.03)		6.43 (0.03)
c.-3515G>A	GA	n/a	32.64 (20.90)	36.32 (8.10)	n/a	0.68 (0.07)	0.80 (0.05)	n/a	1.86 (0.04)	1.76 (0.04)	n/a	1.17 (0.13)	1.60 (0.12)	n/a	6.53 (0.07)	6.43 (0.05)
	GG		51.01 (9.62)	40.95 (6.02)		0.67 (0.03)	0.68 (0.03)		1.78 (0.02)	1.68 (0.03)		1.42 (0.06)	1.89 (0.09)		6.47 (0.03)	6.46 (0.03)
c.-2756A>G	AA	22.3948 (3.3067)	n/a	43.55 (6.27)	0.57 (0.03)	n/a	0.76 (0.03)	1.66 (0.04)	n/a	1.75 (0.03)	1.58 (0.11)	n/a	1.75 (0.09)	6.46 (0.04)	n/a	6.42 (0.03)
	AG	15.5465 (2.7013)		34.87 (8.74)	0.56 (0.02)		0.72 (0.05)	1.67 (0.03)		1.68 (0.04)	1.64 (0.09)		1.79 (0.14)	6.46 (0.03)		6.47 (0.05)
	GG	12.1984 (5.0874)		27.81 (15.14)	0.515 (0.05)		0.55 (0.09)	1.55 (0.06)		1.59 (0.07)	1.47 (0.16)		1.97 (0.24)	6.50 (0.06)		6.56 (0.08)

Table 4 (continuation). Kappa-casein (CSN3). Values marked with different lowercase letters differed significantly ($p < 0.05$).

SNP	Genotype	CSN3						Basic milk components								
		mRNA (RA)			Milk protein concentration (g/L)			Protein (g/100mL)			Fat (g/100mL)			Lactose (g/100mL)		
		PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH	PCH	PWH	PPH
c.-2925C>G	CC	22.39 (3.30)	n/a	38.92 (6.29)	0.58 (0.03)	n/a	0.79^a (0.04)	1.67 (0.04)	n/a	1.74 (0.03)	1.58 (0.11)	n/a	1.72 (0.09)	6.46 (0.04)	n/a	6.42 (0.03)
	CG	15.55 (2.70)		43.88 (8.78)	0.56 (0.03)		0.67^{ab} (0.05)	1.67 (0.03)		1.70 (0.041)	1.64 (0.09)		1.86 (0.14)	6.46 (0.03)		6.47 (0.05)
	GG	12.19 (5.09)		27.81 (15.21)	0.52 (0.05)		0.55^b (0.09)	1.55 (0.06)		1.59 (0.07)	1.47 (0.16)		1.97 (0.24)	6.50 (0.05)		6.56 (0.08)
c.-3012G>C	CC	12.42 (4.56)	n/a	27.81 (15.22)	0.55 (0.04)	n/a	0.55 (0.09)	1.59 (0.06)	n/a	1.59 (0.07)	1.51 (0.14)	n/a	1.97 (0.24)	6.51 (0.05)	n/a	6.56 (0.08)
	GC	18.56 (2.54)		42.29 (8.14)	0.54 (0.02)		0.69 (0.05)	1.67 (0.03)		1.69 (0.04)	1.69 (0.08)		1.86 (0.13)	6.45 (0.03)		6.47 (0.04)
	GG	19.22 (4.14)		39.49 (6.59)	0.62 (0.04)		0.78 (0.04)	1.66 (0.05)		1.75 (0.03)	1.39 (0.13)		1.69 (0.11)	6.48 (0.04)		6.42 (0.03)

n/a – not analyzed due to low frequency of given polymorphism