

Table 2. Concentration α - and γ -Glutamyl Peptides in Selected Cheese Samples

peptide	concentration ^a [μ mol/kg of dm] (rel std dev in %) in													
	Gouda cheese				goat cheese		Miler		Camembert	Mouton	Kernhem	Leerdammer	Swiss Gruyere	Blue Shropshire
	pGC	rGC	GC4	GC44	young	ripened	light	extra						
α -Glu-Ala	0.6(\pm 10.9)	0.3(\pm 11.8)	0.6(\pm 10.0)	2.6(\pm 4.3)	nd ^b	nd	2.1(\pm 3.9)	3.5(\pm 4.7)	16.1(\pm 4.6)	nd	nd	1.6(\pm 5.7)	nd	nd
α -Glu-Asp	0.8(\pm 14.0)	0.9(\pm 9.4)	4.9(\pm 5.7)	18.4(\pm 3.1)	5.7(\pm 7.6)	2.7(\pm 7.0)	27.4(\pm 10.7)	17.1(\pm 2.6)	53.9(\pm 10.1)	15.4(\pm 4.8)	6.9(\pm 4.3)	5.2(\pm 7.9)	3.3(\pm 5.8)	177.6(\pm 2.2)
α -Glu-Glu	1.1(\pm 11.6)	1.1(\pm 8.9)	10.9(\pm 4.3)	60.7(\pm 2.9)	56.0(\pm 3.6)	56.5(\pm 4.6)	90.6(\pm 6.1)	109.7(\pm 5.2)	142.0(\pm 12.2)	64.8(\pm 5.1)	25.2(\pm 8.0)	29.4(\pm 5.5)	52.3(\pm 4.2)	644.1(\pm 2.5)
α -Glu-Gly	1.4(\pm 10.0)	1.3(\pm 8.5)	0.4(\pm 15.2)	2.9(\pm 4.9)	0.8(\pm 11.9)	25.0(\pm 5.3)	11.4(\pm 10.9)	37.1(\pm 10.9)	3.6(\pm 8.8)	20.9(\pm 3.3)	21.6(\pm 5.5)	1.9(\pm 10.0)	18.4(\pm 4.5)	12.1(\pm 7.8)
α -Glu-Thr	nd	nd	0.5(\pm 7.4)	3.2(\pm 10.0)	15.5(\pm 7.2)	15.3(\pm 7.7)	1.8(\pm 9.5)	7.1(\pm 7.5)	1.5(\pm 10.6)	18.0(\pm 4.6)	0.1(\pm 12.3)	2.7(\pm 10.7)	13.5(\pm 3.4)	15.6(\pm 4.6)
α -Glu-Trp	nd	nd	nd	0.1(\pm 13.9)	1.3(\pm 12.4)	15.0(\pm 3.6)	0.1(\pm 12.9)	1.5(\pm 10.1)	0.4(\pm 12.1)	0.8(\pm 11.4)	4.5(\pm 9.4)	0.4(\pm 13.1)	10.0(\pm 7.9)	29.4(\pm 5.9)
α -Glu-Tyr	nd	0.1(\pm 14.9)	0.8(\pm 12.6)	1.2(\pm 8.8)	nd	nd	1.0(\pm 4.7)	1.1(\pm 4.5)	1.6(\pm 6.1)	27.6(\pm 4.8)	nd	nd	nd	nd
α -Glu-Val	0.1(\pm 16.5)	0.5(\pm 3.7)	0.7(\pm 7.0)	4.4(\pm 1.9)	5.4(\pm 10.3)	22.2(\pm 6.7)	nd	15.5(\pm 6.7)	127.8(\pm 7.6)	14.3(\pm 5.6)	3.2(\pm 10.9)	6.4(\pm 3.8)	17.3(\pm 6.9)	127.0(\pm 7.7)
Σ α -Glu-X	4.0	4.2	18.8	93.5	84.7	136.7	134.4	192.6	346.9	161.8	61.5	47.3	114.8	1005.8
γ -Glu-Ala	3.8(\pm 7.9)	3.0(\pm 8.9)	0.2(\pm 9.1)	3.0(\pm 5.3)	8.4(\pm 4.8)	82.0(\pm 2.7)	7.4(\pm 5.0)	31.5(\pm 6.1)	5.5(\pm 11.2)	5.63(\pm 4.3)	16.0(\pm 8.9)	12.4(\pm 9.8)	63.8(\pm 5.2)	54.1(\pm 5.6)
γ -Glu-Glu	<0.1(\pm 17.0)	0.6(\pm 11.0)	0.3(\pm 9.0)	27.6(\pm 2.7)	68.0(\pm 3.6)	769.9(\pm 2.3)	78.1(\pm 0.9)	198.2(\pm 3.0)	26.0(\pm 3.5)	71.8(\pm 3.6)	47.2(\pm 6.8)	134.7(\pm 4.8)	599.3(\pm 7.0)	619.5(\pm 6.0)
γ -Glu-Gln	nd	nd	0.6(\pm 12.4)	13.9(\pm 2.4)	48.8(\pm 2.6)	193.5(\pm 2.2)	46.5(\pm 3.0)	107.1(\pm 2.9)	13.3(\pm 4.4)	27.2(\pm 4.5)	32.9(\pm 8.9)	94.5(\pm 3.4)	147.3(\pm 2.5)	234.1(\pm 3.9)
γ -Glu-Gly	1.4(\pm 6.1)	1.3(\pm 9.5)	3.3(\pm 6.9)	6.3(\pm 3.2)	nd	nd	6.3(\pm 2.7)	12.5(\pm 2.2)	21.4(\pm 3.6)	2.5(\pm 4.9)	6.2(\pm 3.5)	9.3(\pm 2.8)	nd	108.4(\pm 7.4)
γ -Glu-His	nd	0.3(\pm 11.3)	0.3(\pm 10.9)	6.4(\pm 4.8)	21.6(\pm 4.2)	243.1(\pm 2.6)	31.1(\pm 4.9)	117.7(\pm 3.7)	29.7(\pm 5.9)	71.6(\pm 5.9)	40.1(\pm 4.9)	106.6(\pm 5.5)	201.3(\pm 6.7)	59.0(\pm 5.0)
γ -Glu-Leu	nd	0.7(\pm 8.7)	nd	7.1(\pm 2.9)	49.3(\pm 10.9)	351.0(\pm 4.2)	34.9(\pm 8.1)	102.6(\pm 3.1)	11.9(\pm 7.9)	58.7(\pm 6.5)	58.2(\pm 8.4)	58.0(\pm 6.4)	264.0(\pm 4.7)	705.1(\pm 9.0)
γ -Glu-Lys	7.4(\pm 5.1)	6.0(\pm 6.7)	nd	nd	16.5(\pm 3.8)	161.7(\pm 2.3)	nd	20.1(\pm 2.3)	9.1(\pm 3.9)	12.5(\pm 4.8)	15.9(\pm 6.7)	4.7(\pm 5.1)	119.1(\pm 4.1)	22.7(\pm 5.2)
γ -Glu-Met	0.2(\pm 13.9)	0.4(\pm 9.5)	0.7(\pm 12.2)	20.3(\pm 4.2)	53.1(\pm 3.2)	268.8(\pm 2.3)	43.1(\pm 4.3)	164.2(\pm 7.9)	6.5(\pm 3.0)	36.8(\pm 5.6)	41.8(\pm 5.9)	82.9(\pm 3.8)	206.7(\pm 4.8)	458.5(\pm 5.9)
γ -Glu-Phe	0.3(\pm 11.0)	0.4(\pm 8.7)	nd	2.0(\pm 7.7)	23.8(\pm 4.5)	212.3(\pm 1.5)	22.5(\pm 5.3)	55.5(\pm 5.7)	4.7(\pm 9.0)	32.3(\pm 6.1)	44.6(\pm 6.9)	31.7(\pm 6.7)	155.3(\pm 5.9)	366.1(\pm 4.7)
γ -Glu-Tyr	0.1(\pm 18.2)	0.1(\pm 17.1)	nd	0.3(\pm 15.9)	12.2(\pm 5.6)	44.6(\pm 2.9)	5.6(\pm 2.6)	18.8(\pm 4.5)	7.7(\pm 5.1)	0.3(\pm 8.9)	13.1(\pm 8.9)	10.2(\pm 5.6)	32.8(\pm 3.7)	10.7(\pm 6.1)
γ -Glu-Val	0.1(\pm 15.4)	0.5(\pm 6.8)	nd	2.6(\pm 1.8)	18.7(\pm 7.4)	295.3(\pm 2.1)	nd	39.6(\pm 2.4)	21.3(\pm 4.1)	21.3(\pm 4.3)	50.7(\pm 5.1)	13.2(\pm 6.9)	217.7(\pm 4.9)	951.8(\pm 3.6)
Σ γ -Glu-X	13.3	13.3	5.4	89.5	320.4	2621.2	275.5	867.8	157.1	340.6	366.7	558.2	2007.3	3590.0
Σ γ/Σ α	3.3	3.2	0.3	1.0	3.8	19.1	2.1	4.5	0.5	2.1	5.9	11.9	17.5	3.6
Σ Glu-X	17.3	17.5	24.2	183.0	405.1	2757.9	409.9	1060.4	504.0	502.4	428.2	605.5	2122.1	4595.8

^aThe concentrations are given as the mean value obtained for three cheese samples. ^bnd, not detectable.