

Table S1. Mean for 18 quality characters of dry and boiled grain of 20 chickpea genotypes growing in different environments (location, campaign and spring and winter sowing) in south Spain. Standard errors (SE) in brackets

Genotype	Dry grain											
	ADF g/100g DM	NDF g/100g DM	Oil g/100g DM	Oleic acid % oil	Linoleic acid % oil	Protein g/100g DM	Starch g/100g DM	Amylopectin % starch	Amylose % starch	HI	CT (×10 ⁻³) mg/mm ²	SW g
CA2984	5.5 (0.14)	8.8 (0.35)	5.2 (0.07)	28.8 (1.72)	50.4 (1.64)	22.5 (0.42)	44.8 (0.38)	64.9 (1.86)	35.1 (1.86)	1.9 (0.02)	4.5 (0.17)	40.9 (0.90)
CA3026	10.9 (0.13)	13.8 (0.16)	4.9 (0.12)	29.3 (0.91)	52.1 (0.83)	21.0 (0.37)	42.0 (0.49)	62.9 (1.37)	37.1 (1.37)	1.0 (0.01)	9.3 (0.11)	21.7 (0.43)
CA3045	4.6 (0.25)	7.9 (0.26)	5.1 (0.13)	32.8 (1.63)	48.3 (1.52)	23.3 (0.53)	43.5 (0.54)	62.4 (1.73)	37.6 (1.73)	1.1 (0.02)	4.0 (0.15)	37.8 (1.71)
CA3049	5.5 (0.23)	9.0 (0.22)	4.9 (0.05)	29.9 (1.03)	51.2 (0.87)	24.0 (0.32)	42.9 (0.45)	64.3 (1.56)	35.7 (1.56)	1.0 (0.01)	5.0 (0.20)	51.8 (1.11)
CA3050	5.1 (0.15)	8.9 (0.19)	4.8 (0.07)	29.5 (1.02)	50.7 (0.88)	23.8 (0.38)	43.8 (0.43)	64.7 (1.66)	35.3 (1.66)	1.2 (0.02)	4.8 (0.12)	47.4 (1.27)
CA3051	5.8 (0.39)	9.0 (0.28)	4.9 (0.15)	30.1 (1.50)	50.1 (1.17)	23.7 (0.58)	43.3 (0.68)	61.4 (2.37)	38.6 (2.37)	1.1 (0.03)	5.0 (0.29)	38.6 (1.77)
CA3052	5.5 (0.14)	8.6 (0.16)	5.3 (0.06)	31.6 (1.21)	48.2 (1.08)	21.3 (0.29)	45.2 (0.31)	65.2 (1.63)	34.8 (1.63)	1.0 (0.01)	4.9 (0.10)	36.1 (0.66)
CA3057	4.9 (0.14)	8.4 (0.18)	5.0 (0.06)	26.2 (0.73)	53.7 (0.56)	22.3 (0.26)	45.2 (0.33)	65.3 (1.44)	34.7 (1.44)	1.1 (0.01)	4.0 (0.09)	35.1 (0.77)
CA3058	5.0 (0.29)	8.0 (0.22)	4.8 (0.09)	31.8 (1.23)	49.2 (0.98)	24.9 (0.45)	43.5 (0.64)	62.8 (1.41)	37.2 (1.41)	1.1 (0.02)	4.1 (0.19)	35.0 (0.96)
CA3060	5.0 (0.15)	9.3 (0.24)	4.9 (0.08)	31.2 (1.40)	48.4 (1.05)	22.8 (0.46)	44.2 (0.48)	66.4 (1.42)	33.6 (1.42)	1.1 (0.02)	4.6 (0.14)	40.2 (1.04)
CA3062	5.0 (0.22)	7.9 (0.20)	4.9 (0.07)	30.9 (0.94)	50.1 (0.79)	24.7 (0.39)	43.8 (0.52)	65.4 (1.71)	34.6 (1.71)	1.1 (0.01)	3.9 (0.17)	35.7 (0.76)
CA3063	5.8 (0.20)	8.6 (0.21)	5.3 (0.06)	31.8 (1.01)	49.3 (0.77)	22.1 (0.38)	45.2 (0.46)	65.0 (1.47)	35.0 (1.47)	1.0 (0.01)	4.6 (0.16)	40.3 (0.90)
CA3065	5.5 (0.15)	8.1 (0.23)	5.3 (0.08)	29.2 (1.02)	50.4 (0.89)	21.4 (0.21)	45.7 (0.22)	65.6 (1.52)	34.4 (1.52)	1.0 (0.01)	4.4 (0.08)	33.1 (0.95)
Cavir	5.6 (0.16)	9.3 (0.24)	5.0 (0.02)	31.4 (0.95)	50.3 (0.99)	22.1 (0.10)	44.6 (0.37)	64.9 (2.13)	35.1 (2.13)	1.1 (0.02)	4.9 (0.30)	41.5 (1.20)
Fardon	6.2 (0.23)	9.3 (0.40)	5.0 (0.17)	28.4 (1.30)	51.3 (1.23)	22.5 (0.59)	45.0 (0.37)	71.5 (0.29)	28.5 (0.29)	1.0 (0.01)	4.1 (0.10)	32.8 (1.20)
Patio	5.5 (0.23)	9.1 (0.50)	5.2 (0.07)	32.9 (1.56)	47.6 (1.13)	22.9 (0.69)	44.8 (0.52)	70.6 (0.46)	29.4 (0.46)	1.1 (0.01)	3.7 (0.09)	41.9 (1.27)
Pringao	5.4 (0.15)	9.3 (0.35)	5.2 (0.09)	30.6 (1.68)	49.5 (1.24)	22.7 (0.78)	45.3 (0.63)	70.7 (0.71)	29.3 (0.71)	1.1 (0.02)	3.9 (0.06)	41.3 (0.95)
Saborio	5.3 (0.14)	8.5 (0.27)	5.1 (0.06)	35.2 (1.01)	45.9 (0.93)	23.8 (0.31)	43.5 (0.41)	68.5 (0.30)	31.5 (0.30)	1.1 (0.01)	3.9 (0.15)	43.3 (0.82)
Zoco	6.3 (0.18)	10.8 (0.40)	4.9 (0.07)	24.9 (1.30)	53.7 (1.18)	21.0 (0.40)	45.1 (0.58)	64.8 (2.30)	35.2 (2.30)	1.1 (0.03)	5.5 (0.30)	34.1 (0.67)
Blanco Lechoso	4.5 (0.17)	8.4 (0.20)	5.1 (0.05)	32.1 (1.00)	49.4 (0.95)	22.4 (0.22)	44.4 (0.50)	64.6 (2.30)	35.4 (2.30)	1.2 (0.02)	4.1 (0.16)	40.8 (1.77)

ADF, acid detergent fiber; NDF, neutral detergent fiber; HI: hydration index; CT: coat thickness; SW: 100 seeds weight; DM: dry matter

Table S1. (Continue)

Genotype	Boiled grain					
	Grainy 0 - 5 low/high	Broken 0 - 5 very/non	Hardness 0 - 5 soft/hard	Buttery 0 - 5 low/high	Loose skin 0 - 5 very/non	Mouth thickness 0 - 5 smooth/rough
CA2984	2.6 (0.41)	4.8 (0.02)	2.7 (0.46)	3.0 (0.20)	4.8 (0.02)	2.3 (0.15)
CA3026	2.4 (0.54)	4.9 (0.00)	3.2 (0.36)	2.5 (0.44)	4.8 (0.11)	0.9 (0.22)
CA3045	2.3 (0.72)	4.5 (0.21)	2.5 (0.36)	3.0 (0.57)	4.4 (0.43)	1.9 (0.22)
CA3049	2.8 (0.14)	4.8 (0.02)	2.2 (0.24)	2.9 (0.23)	4.8 (0.05)	2.9 (0.21)
CA3050	3.0 (0.26)	4.8 (0.04)	2.5 (0.19)	2.4 (0.16)	4.7 (0.06)	2.7 (0.32)
CA3051	2.2 (0.22)	4.8 (0.08)	1.9 (0.36)	3.4 (0.22)	4.9 (0.00)	2.9 (0.22)
CA3052	1.9 (0.21)	4.8 (0.04)	2.2 (0.21)	2.8 (0.23)	4.9 (0.01)	1.8 (0.16)
CA3057	2.2 (0.34)	4.8 (0.03)	2.0 (0.22)	3.0 (0.24)	4.8 (0.04)	1.2 (0.11)
CA3058	2.5 (0.65)	4.8 (0.05)	2.7 (0.23)	2.2 (0.42)	4.9 (0.00)	1.6 (0.25)
CA3060	1.7 (0.33)	4.8 (0.03)	2.0 (0.22)	3.6 (0.23)	4.7 (0.09)	3.2 (0.15)
CA3062	2.6(0.34)	4.8 (0.06)	2.6 (0.24)	2.6 (0.19)	4.8 (0.05)	1.6 (0.22)
CA3063	2.4 (0.54)	4.7 (0.04)	2.7 (0.36)	3.0 (0.32)	4.6 (0.13)	2.1 (0.18)
CA3065	1.9 (0.25)	4.7 (0.05)	2.2 (0.20)	3.0 (0.25)	4.9 (0.01)	1.4 (0.14)
Cavir	2.5 (0.43)	4.7 (0.13)	2.9 (0.10)	2.2 (0.17)	4.4 (0.17)	4.0 (0.19)
Fardon	1.5 (0.16)	4.7 (0.06)	1.6 (0.24)	3.4 (0.06)	4.3 (0.26)	1.3 (0.21)
Patio	2.8 (0.49)	4.7 (0.19)	2.0 (0.23)	2.9 (0.23)	4.4 (0.31)	2.3 (0.13)
Pringao	2.7 (0.29)	4.8 (0.04)	2.1 (0.24)	2.8 (0.15)	4.6 (0.14)	2.0 (0.29)
Saborio	2.2 (0.47)	4.4 (0.12)	2.2 (0.21)	2.8 (0.29)	4.3 (0.21)	2.3 (0.19)
Zoco	3.7 (0.13)	4.7 (0.04)	3.2 (0.16)	1.6 (0.29)	4.5 (0.26)	3.9 (0.13)
Blanco Lechoso	2.3 (0.46)	4.7 (0.03)	1.6 (0.16)	3.0 (0.28)	4.7 (0.06)	3.1 (0.34)

Table S2. Correlation coefficients (in bold) and their signification levels (in italic) among 18 quality characters of dry and boiled grain of 20 chickpea genotypes growing in different environments (location, campaign and spring and winter sowing) in south Spain.

	ADF	NDF	Starch	Amylopectin	Amylose	Oil	Oleic acid	Linoleic acid	Protein	CT	HI	SW	Hardness	Grainy	Broken	Buttery	Loose skin
	g/100g DM	g/100g DM	g/100g DM	% starch	% starch	g/100g DM	% oil	% oil	g/100g DM	mg/mm ²		g	0-5 soft/hard	0-5 low/high	0-5 very/non	0-5 low/high	0-5 very/non
NDF	0.92 <i>0.000</i>																
Starch	-0.56 <i>0.016</i>	-0.55 <i>0.017</i>															
Amylopectin	-0.21 <i>0.408</i>	-0.16 <i>0.534</i>	0.25 <i>0.309</i>														
Amylose	0.21 <i>0.407</i>	0.16 <i>0.534</i>	-0.25 <i>0.309</i>	-1.00 <i>0.000</i>													
Oil	-0.19 <i>0.446</i>	-0.35 <i>0.154</i>	0.55 <i>0.019</i>	0.10 <i>0.681</i>	-0.10 <i>0.681</i>												
Oleic acid	-0.20 <i>0.425</i>	-0.30 <i>0.226</i>	-0.18 <i>0.487</i>	0.31 <i>0.206</i>	-0.31 <i>0.206</i>	0.38 <i>0.121</i>											
Linoleic acid	0.33 <i>0.184</i>	0.40 <i>0.100</i>	-0.02 <i>0.950</i>	-0.33 <i>0.187</i>	0.33 <i>0.187</i>	-0.48 <i>0.044</i>	-0.93 <i>0.000</i>										
Protein	-0.45 <i>0.059</i>	-0.50 <i>0.036</i>	-0.28 <i>0.259</i>	0.20 <i>0.428</i>	-0.20 <i>0.428</i>	-0.35 <i>0.160</i>	0.37 <i>0.131</i>	-0.34 <i>0.174</i>									
CT	0.92 <i>0.000</i>	0.91 <i>0.000</i>	-0.61 <i>0.007</i>	-0.48 <i>0.042</i>	0.48 <i>0.042</i>	-0.26 <i>0.307</i>	-0.29 <i>0.251</i>	0.40 <i>0.103</i>	-0.51 <i>0.032</i>								
HI	-0.46 <i>0.055</i>	-0.17 <i>0.501</i>	0.06 <i>0.799</i>	0.02 <i>0.936</i>	-0.02 <i>0.936</i>	-0.35 <i>0.157</i>	-0.08 <i>0.750</i>	0.08 <i>0.755</i>	0.21 <i>0.407</i>	-0.30 <i>0.231</i>							
SW	-0.67 <i>0.002</i>	-0.55 <i>0.019</i>	0.03 <i>0.917</i>	0.11 <i>0.662</i>	-0.11 <i>0.662</i>	0.06 <i>0.824</i>	0.34 <i>0.169</i>	-0.37 <i>0.136</i>	0.55 <i>0.019</i>	-0.54 <i>0.021</i>	0.39 <i>0.110</i>						
Hardness	0.49 <i>0.038</i>	0.47 <i>0.051</i>	-0.23 <i>0.363</i>	-0.63 <i>0.006</i>	0.63 <i>0.006</i>	-0.11 <i>0.654</i>	-0.30 <i>0.230</i>	0.27 <i>0.272</i>	-0.25 <i>0.310</i>	0.59 <i>0.010</i>	-0.16 <i>0.523</i>	-0.27 <i>0.272</i>					
Grainy	0.03 <i>0.893</i>	0.18 <i>0.480</i>	-0.07 <i>0.785</i>	-0.27 <i>0.278</i>	0.27 <i>0.278</i>	-0.23 <i>0.367</i>	-0.33 <i>0.179</i>	0.26 <i>0.290</i>	0.09 <i>0.716</i>	0.11 <i>0.652</i>	0.29 <i>0.246</i>	0.23 <i>0.368</i>	0.60 <i>0.008</i>				
Broken	0.22 <i>0.379</i>	0.18 <i>0.466</i>	0.00 <i>0.996</i>	-0.30 <i>0.224</i>	0.30 <i>0.224</i>	-0.12 <i>0.638</i>	-0.48 <i>0.044</i>	0.49 <i>0.040</i>	-0.14 <i>0.580</i>	0.30 <i>0.232</i>	-0.14 <i>0.591</i>	-0.22 <i>0.392</i>	0.01 <i>0.979</i>	-0.09 <i>0.737</i>			
Buttery	-0.22 <i>0.387</i>	-0.26 <i>0.290</i>	0.08 <i>0.759</i>	0.43 <i>0.077</i>	-0.43 <i>0.077</i>	0.24 <i>0.336</i>	0.30 <i>0.225</i>	-0.27 <i>0.270</i>	0.09 <i>0.725</i>	-0.28 <i>0.257</i>	-0.10 <i>0.702</i>	0.15 <i>0.563</i>	-0.74 <i>0.001</i>	-0.81 <i>0.000</i>	0.18 <i>0.463</i>		
Loose skin	-0.03 <i>0.909</i>	-0.11 <i>0.674</i>	0.03 <i>0.907</i>	-0.70 <i>0.001</i>	0.70 <i>0.001</i>	0.18 <i>0.480</i>	-0.31 <i>0.213</i>	0.19 <i>0.454</i>	-0.10 <i>0.700</i>	0.20 <i>0.438</i>	-0.06 <i>0.879</i>	-0.04 <i>0.295</i>	0.26 <i>0.295</i>	0.11 <i>0.668</i>	0.58 <i>0.012</i>	-0.09 <i>0.736</i>	
Mouth thickness	-0.35 <i>0.152</i>	-0.06 <i>0.812</i>	0.05 <i>0.858</i>	-0.12 <i>0.636</i>	0.12 <i>0.636</i>	-0.19 <i>0.448</i>	0.05 <i>0.852</i>	-0.08 <i>0.763</i>	-0.01 <i>0.984</i>	-0.15 <i>0.566</i>	0.59 <i>0.010</i>	0.55 <i>0.018</i>	0.16 <i>0.534</i>	0.43 <i>0.076</i>	-0.34 <i>0.164</i>	-0.28 <i>0.266</i>	-0.22 <i>0.388</i>

ADF, acid detergent fiber; NDF, neutral detergent fiber; CT, coat thickness; HI, hydration index; SW, 100 seeds weight. DM, dry matter